Environmental and Social Impact Assessment Report (ESIA) – Appendix 20, Part 2

Project Number: 50330-001
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INO: Rantau Dedap Geothermal Power Project (Phase 2)

Prepared by PT Supreme Energy Rantau Dedap (PT SERD) for Asian Development Bank

APPROVAL

	POSITION	NAME	SIGNATURE	DATE
Prepared by	SHE Engineer	Erwin Patrisa Floris		
Reviewed By	Sr. SHE Manager	M. Arief Tarunaprawira		
Approved By	VP Relations & SHE	Priyandaru Effendi		**17/05/2013**

REVISION HISTORY

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1 LAND TRANSPORT

1.1 Facts

a. 10,000 crashes each year are caused by fatique drivers
   - o 18 hours awake causes blood alcohol content equal to 0.08% (disinhibition / poorer risk assessment ; poorer motoric response, instinctual, emotional, cognitive and perceptual aspects)
   - o <6 hours sleep triples the risk
   - o Driving at night triples the risks than driving during day time (NSC) due to limitation of vision and possible fatique.

b. 55% of drowsy driving crashes are caused by drivers less than 25 years old

1.2 Background

Driving is one of the greatest risks most likely faced by any Company employee and their Contractors. To minimize the risk, the following journey management standards shall be implemented for Vehicle Operations with a specific business purpose in all Company facilities, including Contractors within their own area for supporting Company activities.

1.3 Purpose

To carefully manage all phases of the transportation process to eliminate hazards and unnecessary exposure, reduce the residual risk through the proper selection and preparation of people, equipment and routes, in order to ultimately eliminate driving fatalities and injuries to all Company employees, families, Contractors and third parties and minimize damage to equipment.

1.4 Application

Vehicles and motorcycle at all Company facilities used for Company business. It includes all Company and Contractors owned and rented vehicle that operates to support Company activities.

1.5 Responsibilities

a. Line Management

   Line management at all levels shall demonstrate active, visible leadership and personal participation in all aspects of journey management by:
   - o Ensuring that drivers under their control have the relevant Company approved driving license before allowing them to drive Company vehicles and to ensure that drivers who drive on Company business meet all requirements.
   - o Promoting safe driving awareness and Company initiatives to minimize night driving and the total number of kilometers driven.
   - o Always searching for safer means of transportation other than driving.
   - o Ensuring that all Company transport / approved transporter are equipped with adequate safety equipment.
   - o Ensuring that the Company transport / approved transporter is maintained in accordance to the manufacturer’s specification

- Providing adequate resources to help drivers conform to the requirements of this Standard, including driver training and a safe transport. With an ever-changing business, particular attention must be given to the hazards of driving in unfamiliar locations.
- Developing Site Specific Procedure, if applicable, to ensure that particular local driving hazards (terrain, weather conditions, driving culture etc.) and ensure that they are addressed through specific training courses.

b. Driver

Any personel that drives a Company transport is responsible for:

- Drive safely and comply with applicable laws and regulation.
- Have a Company approved license prior to driving a Company transport.
- Comply with this Travel / Journey Management Procedure.
- Ensure all passengers comply with applicable Company regulation on the Company transport, e.g. wearing a seat belt.
- Actively participating in pre-trip briefings, if applicable.
- Comply with the pre-trip plans and all other procedures detailed in this procedure.

1.6 Travel / Journey Management Requirements

1.6.1 Management review of Trip Necessity

Managers at every level shall question the need for all journeys, always searching for a way to eliminate the journey or find an alternative means of achieving the trip objective, i.e. use existing shuttle vehicle schedule. Dispatcher shall encourage all departments to coordinate in arranging a business trip.

Where driving is unavoidable, alternatives such as combining trips and using approved Transportation Contractors shall always be explored.

1.6.2 Trip Planning and Execution

All trip to / from operating area should have trip planning with clearly defined route and timing. Once it is determined that the trip risk is increased and unavoidable, Line Manager and Dispatcher shall ensure that:

- A formal pre-trip briefing, if applicable, is held involving everyone involved in the journey
- Potential driving hazards, especially dangerous intersections, are identified in advance, taking into consideration the terrain, weather, known dangerous routes, speed limits, holidays (especially those which involve fasting), etc.
- Appropriate Company transport are assigned to the journey taking into account the hazards identified
- **Only Company approved drivers** with valid certification are assigned for the type of Company transport to be used
- Drivers and passengers are fully briefed on the journey: route, hazards, planned stops, etc.
- Company transport is inspected using an appropriate checklist before the journey begins.
- It may be necessary to take advise from Security Section to get information on the security condition of the route

1.6.3 Speed Limit

All Company/Contractor/Sub-contractor drivers shall comply with the approved Company speed limits set in the specific operating area/ location as well as public road and may have to be lowered during adverse weather conditions. These limits will have been set following a local hazard identification assessment (see SHEMS Section 6.16 Traffic Regulation).

On Company's operating area, these speed limits will be clearly posted at all locations

Drivers shall always be aware of the speed, road condition and weather condition. *A certain location may be used as mark of the speed by the driver and passenger(s).*

1.6.4 Night Driving

Night driving is a journey that all or some part of it is conducted at night.

All night trips at sites to outside Company location shall be approved by the line manager and local top manager before they begin. Wherever night driving required, a site-specific night driving requirement shall be established based on the risk assessment.

a. It is strongly recommended that the safe stop point should be reached at no later than 10pm to avoid the risks of "driving when normally asleep".
b. Driver should have at least one companion to travel during night trip
c. Additional check shall be conducted to ensure that the vehicle may be use safely for night trip and driver is fit for the travel :
    - Head lights
    - Signal lamps
    - Brake condition
    - Tire condition, including spare tire readiness
    - Car emergency equipment (warning triangle, jack, tire kit, tool kit, flash light, fire extinguisher, first aid kit, etc)
    - Towing hook and sling (if necessary)
d. Additional information on road security shall be available from *Security Section*.

1.6.5 Medical requirements

All persons employed as drivers and persons regularly driving vehicles for Company business must be medically assessed to ensure that they have functional capacity to operate a vehicle safely.

1.6.6 Driver's Fitness and Alertness

Drivers must not operate vehicles unless appropriately rested and alert. In particular:

- Driver shall have adequate rest time prior to drive. A process shall be in place to check prior to each journey whether the driver is fit to drive.
- Maximum duty hours for driver should be defined by site line management based on applicable regulations and standards.
- Drivers must advise management when they have a disability or condition that could prevent them from driving safely.

- Drivers shall have the right to refuse to drive when they feel that they are not fully rested or alert.
- Drivers shall be informed on how to identify driver fatigue and alertness, and means of dealing with them.
- A safe location may be determined by Company for convenient stop especially for long hour journey / travel

1.6.7 Driver Training

All Company drivers shall be trained in compliance with relevant Company manual / procedures, including Defensive Driving Course.

1.6.8 Contractor / Sub-contractor Driver Training

100% compliance to section of the Company's Contractor Safety, Health and Environment Management System (CSMS) and Project's SHE plan shall be attained.

1.6.9 Vehicle Accident / Incident Reporting

All on-the-job incident / accident shall be immediately reported to the Superior / Company and shall be not later than the end of the Shift for shift work or when time permits not later than 1 x 24 hours for any other jobs.

1.6.10 Substance Abuse

Drivers shall not operate a vehicle while under the influence of alcohol, drugs, narcotics or medication that could impair the driver's ability to safely operate the vehicle.

Driving a Company transport while under the influence of alcohol or any drugs or narcotics, is strictly prohibited and subject to disciplinary action which may include termination of employment.

Post accident test of alcohol or any drugs or narcotics, if applicable, should be carried out to the driver after vehicle accident occurred.

1.6.11 Mobile Phone and Two-Way Commnuciation Device

Driver is prohibited to use mobile phone and/or two-way communication devices in the following condition:

- Operating a Company vehicle on public roadways.
- Operating a personal vehicle on Company Business.
- Operating a motor vehicle on Company Property, unless allowable areas and circumstances are designated by applicable work site rules and instructions (such as areas restricted from public access inside an operating facility or controlled area).

The driver should safely park the vehicle before using mobile phone and two-way communication devices.

The exception to this is for the use of two-way communication devices as part of convoy management if there is no front seat passenger available to assist, i.e. when escorting a heavy equipment vehicle or onshore drilling rig, or for use during emergency situation. Two-way communication uses in this circumstance should be kept to the minimum as necessary to communicate and control the hazards and risks of the journey being undertaken.

1.6.12 Maintenance of Company Transport

All Company transport and approved Contractor vehicles used for Company business shall be maintained and serviced on a regular basis. Necessary repairs shall be performed immediately in accordance with the manufacture's manual.

1.6.13 Audit / Inspection

Audit shall be implemented to assess compliance to this Journey Management Procedure.
Inspection is conducted regularly using at minimum the pre-trip check-list and other inspection defined by the site specific journey management procedure.

1.6.14 Reassigment and Temporary Assigment

- The highest Company authority at site shall ensure that every work location has a specific plan addressing new arrivals (permanent transfers, temporary transfer and visitors).
  This plan shall be adhered to before the new person is allowed to drive a Company Transport. As a minimum, the plan shall include an orientation briefing on local driving risks and verification of the person's current driving training compliance.
- A good example of this could be Jakarta based engineering or exploration staff visiting the field operations without attending Defensive Driving Training.
- The plan shall address the particular case of persons transferred from a country where they were driving on the opposite side of the road.

1.6.15 Regulatory requirements

Company driver must observe the following government laws and regulations concerning driving:

a) Have a valid driving license to operate the vehicle (SIM
b) Have appropriate health record.
c) Have appropriate and valid car license (STNK) for the vehicle.

1.6.16 Metrics

To help track the total number of accidents and to provide for continuous improvement, Company have established a driving safety metric. Company Management may want to use additional metrics, such as cumulative safe driving distance, to encourage safe performance.

a. Each department shall be responsible for monitoring the performance of its drivers.
b. Line Management shall report the following statistics to SHE Department:
   - The total number of on-the-job vehicle accidents
   - The total distance driven (in miles) for the business
c. Company shall track the percentage of driver training that has been completed for each category of driver.
a. Company shall track the percentage of driving audits completed.

SHE Department shall use the following formula to track its vehicle accident rates:

Vehicle accident rate = <u>Number of accidents x 1,000,000 km</u>

Total km driven

1.6.17 Vehicle (see SHEMS Section 6.18 Vehicle Regulation)

a. General Safety Considerations
- Vehicles shall be used for their designated function. Vehicles shall not be loaded beyond the manufacturer's specified capacities.
- Any Company vehicle which has an obvious mechanical problem affecting the safe operation of the vehicle shall not be driven.
- Transportation of hazardous materials must be done in accordance with applicable laws and regulations.
- Luggage must be secured to prevent loose articles from flying into the passenger area.
- The driver of each vehicle shall walk around his vehicle to promote awareness of hazards such as objects, people or other vehicles prior to driving. During the walk-around driver shall observe the condition of the vehicle (tires, broken lights, etc.), and shall ensure windows, lights, and mirrors are clean to promote maximum visibility while driving.
- Regular vehicle checklist shall be developed and maintained for each area.
- Where possible, vehicles shall be reverse-parked.
- No smoking is allowed while onboard vehicle.

b. Seatbelt
- The wearing of seat belts is mandatory and a condition of employment. Any persons in non-compliance with this rule are liable to disciplinary action which could lead to dismissal.
- Seat belts must also be worn in all cars that are operated by all persons and used on Company business. The number of passengers shall be equal to number of seatbelts.
- All Contractors and Sub-contractors drivers and passengers must comply with the wearing of the seat belt rule.

c. Hand brake
- Hand brake must be set whenever the vehicle is parked.
- Additional stopper shall be used if the vehicle's tire is being changed.

d. Tire
- Tires of the same construction (e.g., radial or steel-belted and size) shall be used on all wheels.
- Tires shall be checked daily and inspected in accordances with the manufacture manual.
- Car tires shall be replaced when tread depth decreases to minimum indicator level.

e. Headrest

Headrest shall be used for front passenger and shall be adjusted to the proper height.

f. Door - Lock

Car doors shall be locked at all times.

g. Vehicle selection

The following procedures must be applied when choosing vehicles for Company business:

- Vehicles with convertible, removable, or no tops must not be used.
- Vehicle to be used on mud terrain must be four wheel drives (4WD).
- Vehicle shall be equipped with Anti-lock Braking System (ABS).
- The following equipment should be installed and securely fixed, where appropriate, on light duty vehicle. As a minimum, vehicles shall be equipped with the following:
  - Head rests
  - A basic radio type to receive any alerts e.g. Economic, Social and Political, road conditions
  - Air conditioner
  - Solar film coating (maximum 60% darkness)
  - First Aid Kit
  - Fire Extinguishers of minimum 2 kg ABC class
  - Towing hooks/sling (nylon tow ropes must not be used)
  - Safety belts for the driver and passengers.
  - Tool kits to change the tire
  - Suitable spare wheel and tire
  - Disable vehicle marker (e.g. warning triangle)
  - Flash light.

- Vehicle is recommended to be equipped with dual airbags or at minimum driver's airbag.
- Vehicle is recommended to be equipped with Global Positioning System (GPS).

Where a risk assessment demonstrates that the risk of rollover due to terrain, a vehicle type or work condition is higher than normal, a properly engineered rollover protection device must be installed (internally or externally).

2 AIR TRANSPORT

2.1 GENERAL

- Employees shall take scheduled flight to travel for Company business.
- Any non-scheduled flight or use of air transport with propeller (rotary) shall be assessed for their hazards and risks by SHE group.

2.2 DOMESTIC

All employees is strongly recommended to travel by Garuda Airways (the state owned airline company). However other reputable domestic providers such as Sriwijaya Air, Lion Air, Mandala and Air Asia might be used if there is no Garuda Airways flight services the route. The use of any other airline shall be assessed by the Company.

2.3 INTERNATIONAL

- Reputable providers shall be used to travel for Company business.
- The approved airline company will be decided by the Company upon sufficient risk assessment.

3 WATER TRANSPORT

3.1 GENERAL

- Employees shall take scheduled water transportation to travel for Company business.
- Any non-scheduled water transportion or special boat shall be assessed for their hazards and risks by SHE department.

4 APPENDIX 1 : LAND TRAVEL NOTICE FOR SPECIAL TRAVEL ARRANGEMENT

LAND TRAVEL NOTICE : SPECIAL TRAVEL ARRANGEMENT (to be filled in by the Employee or Contractor who plans to conduct the journey)		
1.	*Name of Employee/Contractor:*	

2.	*Cellular Phone Number:*	
3.	*Email Address:*	
4.	Place of Destination: Approximate Distance (km): Travel duration (hours) : Estimated Time Departure : Estimated Time Arrival at Arrival :	Address: Phone Contact # at Destination :
5.	*Purpose of Travel:*	

6.	***TRAVEL CHECK LIST***	
	Can the task be completed by facsimile, telephone or email?	[Yes/No]
	Can the task be rescheduled / combined with another one to be made a safer time?	[Yes/No]
	Can the task be done by another person available at the Place of Destination?	[Yes/No]
	What is the main route? (Please mention names of cities/villages you will pass to reach the destination):	
	What is the alternative route? Please mention another route in case the main route is not possible for you to pass:	
	Do you know physical and Security condition of the routes?	[Yes/No/Not Sure]
	What is the type of the vehicle (4WD/4 x 4, MPV, Microbus, SUV, Truck, Trailer, etc.)?	
	Is the vehicle in the good or roadworthy condition (lightings, engine, brakes and clutch work properly and tires are in good condition, etc.)?	[Yes/No/Not Sure]
	Does the vehicle have sufficient fuel and lubricant?	[Yes/No/Not Sure]
	Is the vehicle equipped with necessary safety equipment and materials (seat belt, fire extinguisher, first aid kit, etc.)	[Yes/No/Not Sure]
	Is the driver in a good physical condition (not sick, tired/fatigue, sleepy, etc.) and will be still in good condition after arrival?	[Yes/No/Not Sure]
	Has the Driver had sufficient resting time?	[Yes/No/Not Sure]
	Does the Driver have appropriate driving license (A, B1, B2)?	[Yes/No/Not Sure]
	Know the location of Police Offices, Hospitals and Fuel Stations along the route?	[Yes/No/Not Sure]
	Is it a Convoy Journey? .... *Consisting of how many vehicles?* .... *What are the types of vehicles?*... *Is an escort required?*..	[Yes/No] ……………… Vehicl ……………….. [Yes/No]

7.	*Drivers:*	No.	Name	Mobile Phone #
	(may be described in an Additional attachment, if space not sufficient)			
8.	*Passengers:*	No.	Name	Mobile Phone #
	(may be described in an Additional attachment, if space is not sufficient)			
9.	*Load/Cargo:*		Name	Quantity/Weight
	(may be described in an Additional attachment, if space is not sufficient)			

10.	*Important Notes from Employee or Contractor (to be filled in by Dispatcher) :*
11.	Control Information (to Be Filled in by Driver) :

Has Employee or Contractor arrived safely at Place of Destination? [Yes/No]
If 'Yes',at when/what time? : If not, please put NOTES here for future record or further follow up:

[E.g. if an incident (accident and near miss) had occurred or been found during the journey]

This Notice is submitted by : Name (of Employee or Contractor): On (day/date): At (time): Signature :	This Notice is received by Dispatcher : Name: On (day/date): At (time): Signature:

supremeenergy	SAFETY HEALTH AND ENVIRONMENT WORK RULES	PROCEDURE
CORPORATE	PROJECT EXECUTION PLANNING: SAFETY HEALTH ENVIRONMENTAL	SE-MSHE-WOR-PRO-0002 Revision: 0

APPROVAL

	POSITION	NAME	SIGNATURE	DATE
Prepared by	SHE Engineer	Erwin Patrisa Floris		
	Head of Environment	Andreas Hartono		
Reviewed By	Sr. SHE Manager	M. Arief Tarunaprawira		
Approved By	VP Relation & SHE	Priyandaru Effendi		**17/05/2013**

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1. SAFETY, HEALTH & ENVIRONMENTAL POLICY

2. SAFETY, HEALTH AND ENVIRONMENTAL (SHE) POLICY

2.1. Policy Intent

The Company is determined to implement the highest standards of Safety, Health and Environmental (SHE) execution to ensure that all areas of operation are environmentally proactive and safe places for our stakeholders. SHE is a line function with full accountability throughout the entire corporate structure.

2.2. Policy

It is the policy of the Company to provide a safe and healthy work environment. The Company is committed to proactively protecting human health and the environment. The Company shares this commitment with its employees, our customers, other companies, and the communities we work with. Our policy is to continuously improve our safety and health performance by routinely reviewing our practices, policies and procedures to identify opportunities for reducing accidents and enhancing compliance. Our policy is founded on the following basic principles:

- We will comply fully with applicable safety and health laws and regulations;
- We will review our operations and assess the potential for safety and health risks and will develop and implement plans to manage these risks prudently;
- We will regularly review our safety and health performance to identify opportunities to enhance our performance;

The Company Safety and Health Policies are designed to ensure that specific requirements, performance-based standards, and the intent of regulations are specifically identified in order to minimize interpretive errors. The Company is committed to efficiently reduce the potential impacts of our business on safety, health and environment (SHE) by managing hazards, preventing injury, reducing waste, emissions and discharges and by using energy efficiently. We will eliminate injury by observing hazards, reporting and rectifying all unsafe actions and any condition which could lead to an incident.

Each employee is responsible for complying with company policies, guidance and procedures to ensure that work is performed in a safe and healthful manner. Responsibilities for SHE performance shall be visible throughout the organization with clear management accountability. Full implementation of SHE Management Policies throughout the entire life of the project is essential to our business. Every employee, affiliate, consultant, contractor and subcontractor of the Company shall unconditionally support and rigorously apply the Supreme SHE goals, objectives and all statutory requirements.

Our business, operational and implementation plans and personal objectives shall including quantifiable measurable SHE targets are that will be established annually, reviewed regularly and adjusted as needed to improve the effectiveness of the program. Every employee is accountable for implementation of this policy. If you have any doubt or questions, don't hesitate to seek guidance from your immediate supervisor.

Safety is everyone's responsibility. We are all responsible for both our own safety and that of our co-workers. This objective is fundamental to our business. All employees of

Company and Contractors have the same responsibility to comply with safety precautions during performing their work for Company. We are all responsible to work correctly and safely.

In carrying out the policy intent, the Company will:

- ensure that systems are developed and established to identify and control hazards within the work place and to monitor SHE performance.
- ensure that all employees to understand that Safe Operations is "good business", and has an equal importance with any other business matter.
- motivate and encourage all employees, suppliers (vendors and contractors) and other stakeholders to maintain high standards of SHE consciousness.
- communicate openly with employees, suppliers and all stakeholders to continually improve the SHE standards.
- meet all legal obligations wherever we operate and always strive to exceed requirements.
- adopt best practices and apply standards that protect the Safety and Health of the employees and prevent harm to the Environment.
- follow written procedures for high risk or unusual situations.
- involve the right people in decisions that affect SHE procedures and equipment
- ensure that every employee understands that have the duty to prevent SHE losses and provide a safe and healthy place of work.

Jakarta, May 2011

Supramu Santosa

President & CEO

2. INTRODUCTION

The requirements described in this Section are designed as minimum requirements. If it is deemed necessary, Supreme Energy's Safety, Health and Environmental Manual and Contractor Safety Management System (CSMS) shall be referred to cover any specific needs related to the work.

3. CONTRACTOR RESPONSIBILITY

All Contractors working on Supreme Energy (SE) premises are required to ensure that their employees comply fully with all SE SHE regulations, policies and procedures.

Contractors are responsible for providing Personal Protective Equipment (PPE) for their employees and their Sub-Contractors while they are working on SE premises. PPE is clothing, equipment or substances designated to be worn by someone to protect them from risks of injury or illness.

Contractors shall ensure that its employees and its Sub-Contractor's employees are trained and competence to perform the work in a safe, healthy and environmentally responsible manner.

Contractors shall ensure that all Contractor furnished machineries, tools and equipment are maintained properly, in a safe operating condition, are inspected regularly, and have been re-checked and accepted by an authorized SE Representative.

Contractors shall take all necessary SHE measures in relation to the work to be provided and shall conduct itself and its work-force in such a way as to comply at all times with the provisions of the national and/or international SHE regulations pertinent to work.

Contractors shall take such reasonable steps to provide a safe and healthy working environment for its personnel, Company's personnel and related third parties in the performance of this work.

4. SAFETY AND HEALTH

4.1 Safety Procedures and Safety Plan

The Corporate wide SHE procedures (published as SE SHE Manual) and SHE Plan (published in SE CSMS Manual Chapter 5 and Appendix III.2) shall be complied by all employees, Contractors, sub-contractors and visitors. A Safety Officer will be appointed by SE to coordinate with Safety Officers to be appointed by each Contractor and to oversee compliance with safe working practices.

The procedures include all required general safety procedures for normal construction site as well as for those which are unique to a geothermal site, plus provisions for medical and first aid treatment, site evacuation and notification of incidents, including the following:

- Safety clothing – headgear and footwear
- Welding and cutting safety – goggles / face masks, gloves, exclusion barriers, fire sentries and fire fighting equipment, radiography
- Lifting – general dangers of heavy lifts overhead, testing of slings and other equipment, control of cranes
- Excavations – maximum depth, requirements for shoring sides of excavations, roping-off excavations
- Electrical hazards – high voltages, wandering / extension leads to be protected, portable equipment, earth fault isolators to be used, overhead transmission lines
- Gas hazards – dangers in enclosed areas, excavations, pits and holes, H_2S and CO_2 gases, portable monitor equipment
- Steam and hot water hazards – water and steam within the steamfield systems, natural thermal features
- Drilling and other sumps – to be fenced off, safety life lines to be fitted, safety harness to be available
- First aiders to be nominated, first aid equipment to be supplied and signed
- Ambulance, medical support
- Reporting of accidents, accident register

Particular attention must be given to the presence of a local population who conduct farming in the area and whose homes are within the project area. Care must be taken to ensure that no injury can eventuate to people and livestock.

4.2 Safety in Design

All designers, whether SE or Contractor, are to pay particular attention during their design to the safety of operators, maintainers and members of the general public who may be in the area.

4.3 Safety in Construction

All Contractors are required to produce a safety plan and detailed safety procedures to ensure that the work will be conducted with due regard to the SHE aspects.

Copies of the source documents shall be provided to SE if the procedures are referenced only. This plan shall comply with the SE Corporate SHE Policy and is to be submitted for review and approval by a SE SHE representative.

4.4 Safety Briefing

All Contractors are to hold weekly safety meetings for all employees on the site. These safety meetings are to include particular reference to geothermal hazards:

- steam and other hot, pressurized fluids
- geothermal gas (H_2S and CO_2)
- fumarole areas

The meetings shall also include reference to normal hazards to personnel, assets and the environment encountered during construction, including:

- electrical hazards
- use of portable power tools
- overhead power lines
- welding and cutting hazards
- ladders and scaffolds
- working at height
- general working hazards
- use of lifting equipment, cranes, etc
- excavations
- fire prevention
- disturbance to environmental and community
- health hazards
- security

4.5 Tool Box Meeting

Tool box meetings shall be held before the start of each job to coordinate the tasks to be done. All involved personnel shall participate in these meetings.

4.6 Site Safety Checklist

Each Contractor's Site Manager is to regularly prepare and sign a Site Safety Checklist and submit to the Engineer's Representative at each weekly site meeting or when the SE SHE Representative requires it.

The SE CSMS Manual Appendix V.I SHE Inspection Checklist should be used as the basis for this Checklist, although this may be modified as agreed with the SE SHE Representative and the Engineer's Representative to suit the particular contract.

4.7 Alcoholic Liquor or Drugs

The project base camp and project areas are deemed to be "dry". No alcohol or illegal drugs are to be brought onto or consumed on the project premises. Any worker found under the influence of alcohol or illegal drugs at work will be summarily dismissed.

4.8 Arms and Ammunition

Arms or ammunition are not permitted at any time on the site or on any of the project facilities, except for use by authorized and trained security guards personnel or members of the Indonesia police and army forces.

Arms in possession of security guard personnel are to have a corresponding license issued by the Indonesian police force. It is the responsibility of the security guard company to ensure that this requirement is observed.

4.9 Protective Equipment and Clothing

The wearing of appropriate safety equipment is mandatory on the site. As a minimum, this will include safety headgear and appropriate footwear (non-slip safety shoes or boots or equivalent robust footwear are to worn at all times on sites except inside an office space).

4.10 Fire Protection

Precautions are to be taken against fire, both within the actual construction environment and also within the rural areas in which the Project is located.

Appropriate portable fire fighting equipment is to be available at all sites involving “hot work”, such as welding or cutting.

All materials shall be stored and handled with due regard to their fire characteristics. Material shall be stored in such a way as to minimize the spread for fire internally and to permit convenient access for fire fighting. Storage shall not obstruct means of exit.

Smoking is not to take place during any operations involving the transfer of hydrocarbon fluids and fuels. Cigarette butts are in all cases to be properly disposed of after being carefully extinguished. Smoking is not permitted on or adjacent to any drilling rigs or inside an office space.

Heat and/or smoke detecting devices and fire alarms are to be installed in certain location as appropriate (including buildings and warehouses) and are to be kept in good condition and tested from time to time an authorized party. In other areas where no permanent detection and alarm systems are installed, emergency telephone numbers such as fire fighting department, shall be conspicuously posted.

4.11 Flammable and Combustible Liquids

Special care must be undertaken to handle flammable or combustible liquids. Storage areas and containers shall be conspicuously labelled “Flammable” and the related safety signs such as “no smoking” shall be posted at surrounding area.

Storage areas shall be kept free of weeds, debris and other combustible material not necessary for the storage.

Storage of flammable and combustibel liquids shall have containment bund and/or drip pan.

4.12 Gas Hazards

Geothermal project involve a particular risk from build up of geothermal non-condensible gas e.g. primarily CO_2, with a significant proportion of H_2S. Both of these gases are heavier than air and can build up in holes and excavation. CO_2 does not support life and causes death by suffocation. Its action can be insidious and an individual may not realize that he or she is in danger until too late. H_2S is poisonous and in higher concentrations it is not detectable by smell.

Well cellars and deep excavations are not to be entered without first checking for the presence of gas and oxygen content. Forced ventilation may be required to make safe entry to the hole concerned.

Personal and portable H_2S monitors (and oxygen monitor, as appropriate) are to be available on the Project and are to be available whenever undertaking any well operations or discharging geothermal fluids or steam.

4.13 Fluid Discharges

Geothermal fluid is hot, under pressure and very dangerous. Care is always to be exercised when discharging geothermal fluids (two-phase, steam and/or brine). In particular the discharge route is to be clearly defined and checked clear of personnel and livestock. Sentries are to be posted to ensure that personnel stay clear. Also, as some discharges are very noisy, adequate warning must be given to workers and residents in the general vicinity.

4.14 Electrical Hazards

The power supply onto the site is at 13.8 kV. This will be transformed down to 220-240 V for construction purposes. These are dangerous voltages and care is to be taken to ensure that all equipment being used is correctly grounded in accordance with manufacturer's instructions. Equipment in use on site is to be inspected regularly for worn leads or other damage which could result in electric shock and labelled to show the date of last inspection.

All extension leads are to be supported above ground to avoid risks of vehicles running over them, heavy or sharp weights being placed on them or their immersion in water, or are to be suitably protected with timber either side to avoid direct weight on top of them.

Care is to be taken with mobile cranes, etc that no contact is made with any overhead lines. Operators are to be warned of the presence of any overhead lines and must have a sentry / signal man available to watch for inadvertent approach to such lines.

Overloading an electrical fitting shall be avoided.

4.15 Welding and Cutting

Suitable fire protection equipment is to be available whenever cutting and welding operations are taking place. This includes operations in the field where there is a risk of starting grass or bush fires. Care is also to be taken that personnel are not standing in a position where they might be burned by falling slag or sparks or be exposed to direct arc glare. Welding area shall be sufficiently barricaded to prevent unauthorized entry.

Before starting welding or cutting:

- Operators must be properly trained and supervised.
- An assistant is to be provided to every operator. The assistant is to be instructed to watch for, recognize and resolve fire hazards.
- Secure all gas cylinders so they do not tip or fall.
- Avoid wet or damp area which can cause a serious electrical shock.
- Cutting and welding shall be permitted only in areas are or have been made fire safe.

- Personal protective equipment is mandatory:
  - Appropriate eye protection is required, including but not limited to, welding mask and goggles with side shields.
  - Welding gloves and apron.
- Ensure all equipment used is maintained in a safe condition.
- Never strike an arc in the presence of other people whose eyes are not shielded.
- Gas cylinders shall be moved by tilting and rolling them on their bottom edges. They shall not be intentionally dropped, struck, or permitted to strike each other violently.
- Fuel gas hose and oxygen hose shall be easily distinguishable from each other. A single hose having more that one gas passage shall not be used.
- Torches shall be lit by friction lighters and not by matches or from hot work
- Cylinders shall be kept in an upright position and securely tied at their body to a rigid stand. Use of cylinder cage is preferred.
- Cylinders shall be kept far enough away from the actual welding or cutting operation so that spark, hot slag, or flame will not reach them. When this is impractical, fire resistant shield shall be provided.
- Cylinders, including empty cylinders, shall be marked for its content.

4.16 Radiography

When radiography of welds is being undertaken, suitable warning notices are to be placed to establish an exclusion zone around the working area. Sentries are to be used to control vehicle traffic passing the working area.

Radiography personnel and equipment shall have a valid license from BATAN.

Radiography equipment shall be stored in a safe manner when not in use.

4.17 Scaffolding

Scaffolds shall be erected properly to avoid fall hazards. Scaffold nust be rigid and sufficient to carry out its own weight plus four times the maximum intended load without settling or displacement, and shall be accessed by ladder or similar.

All openings at the platform shall be guarded. Scaffolds must be equipped with guardrails, midrails and toeboards. Scaffold board overhangs shall be minimised.

A minimum 0.6 m wide working area / surface shall be installed for working platform.

4.18 Working at Height

Safety harness shall be worn when working in areas of more than 1.5 meters above the working surface, or as prescribed by applicable work rules or regulations.

4.19 Blasting

Blasting activities shall only be carried out with the express permission of the Site Construction Manager. All project personnel shall be advised prior to the start of blasting and the blasting area should be cleared at the start of work. Perimeter sentries are to be posted around the work area, equipped with radios to ensure coordination of the operation, and they shall be required to visually confirm that no persons are within the safety radius established by the blasting officer.

Explosives are not permitted to be stored near or within working areas or in the base camp area; Explosives must be storage in approved buildings / containers situated at least 200 m from any work area or other facilities. The area proposed for temporary storage of explosives is at the open yard area, where a security guard is placed to maintain security.

4.20 Excavation

Excavation presents several types of hazard which need to be addressed:

- Gas hazard – within the project area there is a risk of geothermal gas being emitted from the soil. This gas is mostly carbon dioxide (CO_2) with some hydrogen sulphide (H_2S). These gases are heavier than air and will tend to collect in excavated pits. Portable oxygen content and gas detection equipment must be used to test the air in excavations before allowing anyone to enter a hole or an excavation. Continuous forced ventilation with blowers may be necessary to make a safe entry. Additionally, a sentry must always be present at the surface, equipped with safety lines, to monitor and assist any worker who may be overcome by gas.
- Soil collapse leading to burying or crushing of workers. The soils shall be classifed for the class of soil involved and suitable protection plan shall be established by the person responsible for excavation activites. Sloping / shoring / battering / benching requirements are to be determined to prevent collapse and entrapment.
- The bottom edge of spoiled ground shall not be stored less than 0.6 m from the trench / excavation.
- If digging is using excavators / heavy equipment / dump truck, precautions shall be made for safe access and parking of the equipment to prevent collapse / disturbance / vibration to the excavation.
- Risk of falling into the excavation. All excavations are to be cordoned off with temporary posts and safety tape warning of the danger. In any locations where workers are required to cross any excavation more than 0.5 m deep, a suitable walkway with guardrails is to be provided.
- Flooding. Work inside an excavation area shall be reassessed after weather change such as heavy rain. Flood water shall not be allowed.
- Damage to other facilities and structures. Before commence any excavation work, all underground and overhead facilities and adjacent structures shall be identified to prevent injury to personnel, damage / collapse of structures, and business interruption

All excavations deeper than 1.5 m must be previously checked by a competent civil engineer to assess the hazards and determine requirements for safe excavation. Excavation working permit shall be made available.

4.21 Confined Space Entry

The entire workplace shall be evaluated to determine which areas are confined spaces. Areas determined to be confined spaces shall have warning signs posted at all points of possible entry. (A sign reading "DANGER - CONFINED SPACE - DO NOT ENTER" or similar language would satisfy this requirement).

Entry into a confined space shall require a specific permit prepared by a Contractor's competent person and is then to be reviewed by the SE Engineer's Representative and Safety Officer prior to submission for approval by the SE Engineer.

4.22 Heavy Lifting

All operations involving the lifting of loads in excess of 10 tonnes are to be carried out in accordance with a pre-approved lifting procedure. Lifting procedures are to be prepared by the Contractor's engineer directly responsible for carrying out of the work and are then to be reviewed by the SE Engineer's Representative and Safety Officer prior to submission for approval by the SE Engineer.

All lifting equipment (i.e. mobile crane, overhead crane, etc.) and lifting gears shall regularly be inspected and certified by an authorized party.

The Safe Working Load (SWL) shall be indicated on lifting equipment.

Only certified operators are permitted to operate such lifting equipment.

4.23 Hydrotesting

Wherever possible, pressure testing shall be carried out in a permanent dedicated area. Concrete walls with inspection windows shall shelter such area.

When it is not possible to do this way, pressure testing shall be supported by a Job Safety Analysis and controlled under the Permit To Work procedure. As a minimum barriers and warning signs shall be erected at a safe distance around the concerned area.

In any case warning tags shall be used to identify lines under test.

Pneumatic tests and very high-pressure hydro-testing (above 5.000 psig or 350 bar) shall be only conducted in sheltered area.

4.24 Drilling

Drilling and related activities shall be carried out in accordance with American Petroleum Institute, Recommended Practices for Occupational Safety for Oil and Gas Well Drilling and Servicing Operations, API RP 54, which should be referred to in conjunction with this Plan. Where applicable, compliance with the National and Local standards, codes or regulations will be mandatory and take precedence over the requirements of the API Recommended Practices.

4.25 Work Permits

Work which requires isolation of energi (fluids, electrical power, mechanical, heat, etc) is to be undertaken only when a Work Permit has been issued by the appropriate authorities. This form is to be prepared by the Contractor in consultation with the SE Engineer’s Representative, who is then to organise the requisite isolations and, when safe to do so, issue the permit to the Contractor, who is to sign receipt of the permit. On completion of the work, the Contractor is to certify that the isolations can be removed, when the Engineer’s Representative is to arrange for their removal and the cancel the permit.

All valves, isolating switches or fuses and other isolating devices which are involved in an isolation for a Work Permit are to be locked and tagged in accordance with the Lock Out Tag Out (LOTO) procedure.

Prior to undertaking excavations, the Contractor is to request an Excavation Permit from the appropriate authority. The Engineer’s Representative is to check for the presence of underground services or other hazards, such as the potential for interference with the safe passage of personnel or vehicles or the possibility of a gas hazard, and advise the Contractor of any precautions to be observed. The Engineer’s Representative shall also advise the Contractor of any requirements for an Owner’s Representative to be present when opening the excavation or to give approval for backfilling.

A confined space entry permit shall be made and approved by appropriate authorities before entering any confined space.

4.26 Lock Out Tag Out Procedure

Lock Out Tag Out (LOTO) is a procedure used to identify items (such as valves, switches etc) that are not to be operated because their operation could result in damage to plant or injury to personnel. Operation in this context includes the opening or shutting of valves, operating switches, inserting blank / blind, removing fuses, etc i.e ensuring that all hazardous energy sources are positively isolated.

LOTO procedure needs to be controlled carefully to ensure the safety of people working on the project while avoiding unnecessary operational restrictions.

4.27 Housekeeping

Aisles, walkways, corridors and passageways shall be clearly marked and kept free from obstructions.

Contractor shall allocate adequate time and resources to maintain an acceptable level of housekeeping and cleanliness in all working areas.

Particular attention shall be paid to housekeeping and cleanliness at height to prevent falls of materials on persons working below. Wherever possible safety nets shall be used.

All Contractors and personnel are to observe a “clean site” policy. There is to be no uncontrolled disposal of garbage, litter or waste materials. Contractors are to ensure that their employees place such materials in designated places and containers for collection and appropriate disposal.

4.28 Fire

All Offices and Administration building shall be equipped with a proper fire protection system that may include heat / fire / smoke alarms and fire extinguisher systems. Safe briefing area shall be determined.

4.29 Vehicles

Vehicles and drivers using project roads and within the project site and base camp are to follow normal Government road code requirements, including the wearing of safety belts. Note that there is a site-wide speed limit of 40 kph, and 60 kph at public / access road. Speed is further restricted in selected area as indicated by signs. Furthermore, care is to be taken always to drive within the prevailing conditions.

Particular care is to be taken when driving on un-metalled roads which may be slippery when wet. On narrow roads, priority is to be given to vehicles coming downhill. Care is also to be exercised when passing work places where a worker may accidentally step into the path of an oncoming vehicle, where obstructions may be found in the roadway or near to excavations.

Drivers should be aware that on roads within the project area and the public / access road, particular care should be taken, especially at night, for livestocks, motorcycles, and pedestrians using the same roads.

4.30 Accidents

All accidents and health and safety related incidents SHALL be reported to the SE Safety Officer (through the Engineer's Representative in the case of Contractors and their Sub-Contractors) as soon as possible, no later than 12 hours after the event by phone or radio (first advice) and in a hard copy.

All the Contractors shall provide monthly accident statistics to the SE Engineer and Safety Officer within the first five (5) calendar days after the end of the month, including total man hours worked in the month, total number of accidents and total lost work time (man-hours).

The SE Safety Officer is responsible for maintaining accurate and up-to-date records and statistics of accidents and other health and safety incidents. These will be included in the Project Manager's monthly report.

4.31 Hazard Communication

Contractor shall provide the employees with effective information (e.g. posters, displays, letters, programs, etc) and training on workplace hazards and hazardous materials / chemicals.

Hazard communication program shall also ensure that all employees working with chemicals know the hazards of those substances and use the proper protective equipment. Material Safety Data Sheet (MSDS) shall be available at sites.

4.32 Emergency Preparedness

Contractor and its sub-Contractor shall have emergency preparedness and Emergency Response Plans and Procedures (“ERP”) that are available at all times throughout the duration of the Contract.

Contractor shall assist SE to create the “Bridging Document” to indicate and clarify the agreed communication and coordination links between Contractor and SE emergency response plans.

5. ENVIRONMENTAL

5.1 Environmental Impact Assessment

An environmental impact assessment has been undertaken as part of the permitting process for the Project.

5.2 Ongoing Environmental Monitoring & Compliance

A Safety, Health and Environmental (SHE) Manager has been appointed to oversee compliance with the requirements of the Environmental Impact Assessment and the Environmental Permits.

Contractor shall comply with all laws, rules and regulations of governmental agencies having jurisdiction, which now exist or may be promulgated during the term of the Contract, relating to the control and prevention of damage to the environment

5.3 Waste Management

Site cleanliness is important for both safety and environmental reasons. All Contractors are to maintain clean work areas and to correctly dispose of rubbish and waste material on a daily basis.

The site waste management system consists of the classification, collection, transport, recycling or disposal of waste materials produced during construction and plant operation activities and domestic waste.

Waste Classification

This is the identification of the nature of the waste and sorting into appropriate groups, depending on the eventual disposal requirement. Groups include:

- Paper
- Plastic
- Organic material
- Metal
- Oil and oil contaminated material
- Specifically identified hazardous materials (drill sludge, dril cutting, hazardous chemicals and its containers, etc)
- Other inorganic (soil, rock, concrete, etc)

Suitable containers are to be provided around the work site to enable waste material to be easily classified and properly disposed of. In the case of hazardous waste, the SHE Manager is to be advised of the presence of this and will make separate arrangements for collection and disposal.

5.4 Spoil Disposal

Spoil is only to be disposed in designated areas. The SE Civil Engineer will designate any spoil disposal areas required.

5.5 Notification

Contractor shall notify SE Engineer Representative and SHE Representative immediately with respect to any pollution, loss, damage, claim or demand (or occurrence which may give rise to same) resulting from the work performed under the Contract. Contractor shall report to Company any incidents of non-compliance with legislative and regulatory environmental requirements that occur during the performance of the work.

5.6 Vegetation

Vegetation is important in stabilizing soil surfaces. Vegetation is NOT to be stripped from the ground unless absolutely necessary, in which case the SHE Manager is to be advised so that he can determine any re-vegetation requirements. Trees in particular are not to be disturbed without the permission of the Project Manager and the SHE Manager.

SE will establish a re-vegetation plan, primarily aimed at planting trees to support sustainable environment.

6. HEALTH

6.1 Medical Fitness

In hard environmental conditions or when local medical assistance is weak or remote from the working site, Contractor shall take appropriate measures to ensure that their employees are “fit to work”.

6.2 Working Rhythm

Contractor shall grant a reasonable rest time to its personnel on daily, weekly and yearly basis.

6.3 Occupational Noise Exposure

When workers are required to work in areas where the sound level exceeds the long term permissible noise exposure level of 85 dB(A), hearing protection equipment (ear plugs or ear defenders) must be provided and worn.

Noise level signs shall be posted at appropriate equipment, locations and for certain activities that produce excessive noise.

6.4 Ergonomic

In order to avoid musculo-skeletal inflammatory diseases attention shall be paid to tasks with repetitive movement or uneasy long time posture and corrective measures shall be taken.

6.5 Lighting

Adequate lighting shall be provided to all working areas.

Portable lighting equipment shall be fitted with an approved plug.

Only authorized personnel shall undertake repairs to lighting equipment.

6.6 Toilet Facilities

Toilets facilities shall be provided on working site in sufficient number and shall be regularly cleaned and maintained.

There shall be no discharge of human waste direct to the environment. Septic tank shall be the minimum requirement. Care shall be taken so as not to pollute the water supply used by others such as ground water.

6.7 Drinkable Water

Drinkable water shall be provided in several locations and in sufficient quantity on construction and installation sites.

Quality of supplied water shall be regularly tested by competent persons.

6.8 Accommodation and Catering

Accommodation provided to personnel shall be of a good standard and equipped with safety features.

Catering service shall be of a good level and adapted to customs of people working on the construction or installation site. Catering personnel shall be certified and shall undergo regular medical examination and regular sanitary inspection.

Kitchen, freezers, refrigerators and restaurant shall be regularly inspected by competent persons. For freezers and refrigerators a special attention shall be paid to the control of temperature.

supremeenergy	SAFETY HEALTH AND ENVIRONMENT CONTRACTOR SHE MANAGEMENT SYSTEM	PROCEDURE
CORPORATE	GUIDANCE FOR CONTRACTOR SHE MANAGEMENT PLAN	SE-MSHE-CSM-PRO-0002 Revision: 0

APPROVAL

	POSITION	NAME	SIGNATURE	DATE
Prepared by	SHE Engineer	Erwin Patrisa Floris		
Reviewed By	Sr. SHE Manager	M. Arief Tarunaprawira		
Approved By	VP Relations & SHE	Priyandaru Effendi		**17/05/2013**

REVISION HISTORY

REV	DATE	BY	REVIEWED	APPROVED	DESCRIPTION
0					For Use

TABLE OF CONTENTS

1 INTRODUCTION

There are compelling economic reasons for reducing work-related Iincidents / accidents and ill-health, as well as ethical and regulatory reasons for doing so. A proactive SHE management promotes business efficiency and ultimately, profits.

Indonesia has a comprehensive legal framework for SHE, requiring organizations to manage their operations safely without damaging the environment and exposing the workers to risks of injury and to prevent hazards that may result in occupational diseases and health-related problems. SHE education and training programmes ensure effective implementation and seek to improve the overall SHE performance in organizations.

SUPREME ENERGY (the Company) believe that all successful organizations actively manage SHE as an integral aspect of their business. We also believe that organizations which integrate SHE into the heart of their businesses are also creating a distinct advantage as employers of choice are equally successful in public relations and impact marketing to consumer / the public.

As a responsible corporate citizen, SUPREME ENERGY as well as it's Contractor will follow Government of Republic Indonesia Regulation and SUPREME ENERGY Regulation or any SHE requirement in order to implement an effective SHE Management System in any activities within SUPREME ENERGY area.

2 PURPOSE

To implement the SHE Management System in a project, therefore to get the best quality for Health and Safety and to prevent accident to human, property and the environment.

3 REFERENCES

- Law of The Republic of Indonesia Number 1 of 1970 regarding Safety in The Work Place (UU No.1 Tahun 1970 Tentang Keselamatan Kerja).
- Decree of Minister of Mines and Energy No. 555.K/26/M.PE/1995 regarding Safety and Health for Mining
- SUPREME ENERGY SHE Manual
- SUPREME ENERGY SHE Procedure
- Requirements of The Contract
- International Standards, Guidelines and Industrial Practices as Set Forth in The Specifications.
- Special Project Standards (AMDAL, ANDAL, UKL and UPL)
  Indonesian environment legislations applicable to the Project are as follows:
- Republic Act No. 23/1997 regarding the Environmental Management
- Government Regulation No.14/1992 regarding Traffic and Road Transportation

- Government Regulation No.41/1999 regarding Control of Air Pollution Control.
- Government Regulation No. 74/2001 regarding Hazardous Material Management.
- Government Regulation No.82/2001 regarding the Management of Water Quality and Water Pollution Control.
- Government Regulation No. 18/1995 and 85/1999 regarding Toxic and Hazardous Waste Management.
- Minister of Mines and Energy Regulation No. 103.K/088/M.PE/1994 regarding Supervision of Implementation of Environmental Management Plan & Environmental Monitoring Plan (RKL-RPL).
- Minister of Environment Decree No. KEP-42/MENLH/10/1996 regarding the Standards of Liquid Wastes of Oil and Gas and Geothermal Activities.
- Minister of Environment Decree No.13/MENLH/3/1995 regarding the Standard of Emission from Fixed Sources.
- Minister of Environment Decree No.35/MENLH/10/1993 regarding the Standard of Gas Emission of Vehicle Exhaust.
- Minister of Environment Decree No. 48/MENLH/11/1996 regarding the Standard of Noise Level.
- Minister of Environment Decree No. 111 of 2003 regarding the Permit Guideline for the Waste Water Discharge to the Environment.
- Minister of Environment Decree No. 115 of 2003 regarding Determination of Guideline for Water Quality Status.
- Local Governor's Regulation regarding the Water Quality Standards and its Usage in Province.

4 ORGANIZATION

The organization structure that includes Company's SHE organization, SHE organization in site and SHE committee organization are as follows :

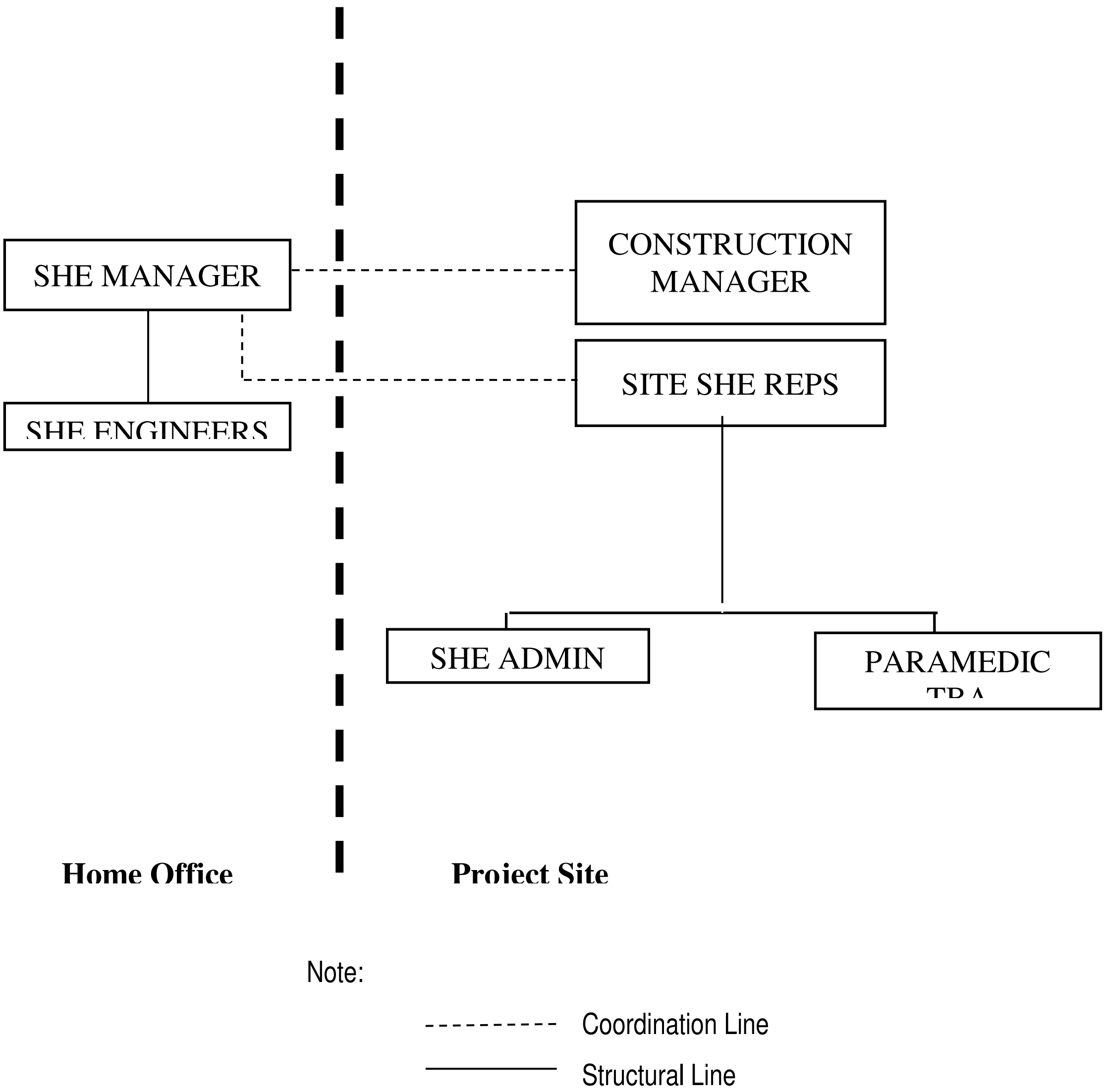
4.1 COMPANY'S ORGANIZATION STRUCTURE

SUPREME ENERGY will assign a representative to each work. The representative shall, among others :

a. Have the highest authority for the whole work activities
b. Responsible to manage the work safely

4.2 COMPANY SITE ORGANIZATION STRUCTURE

A typical Company organization structure at site is as follows :

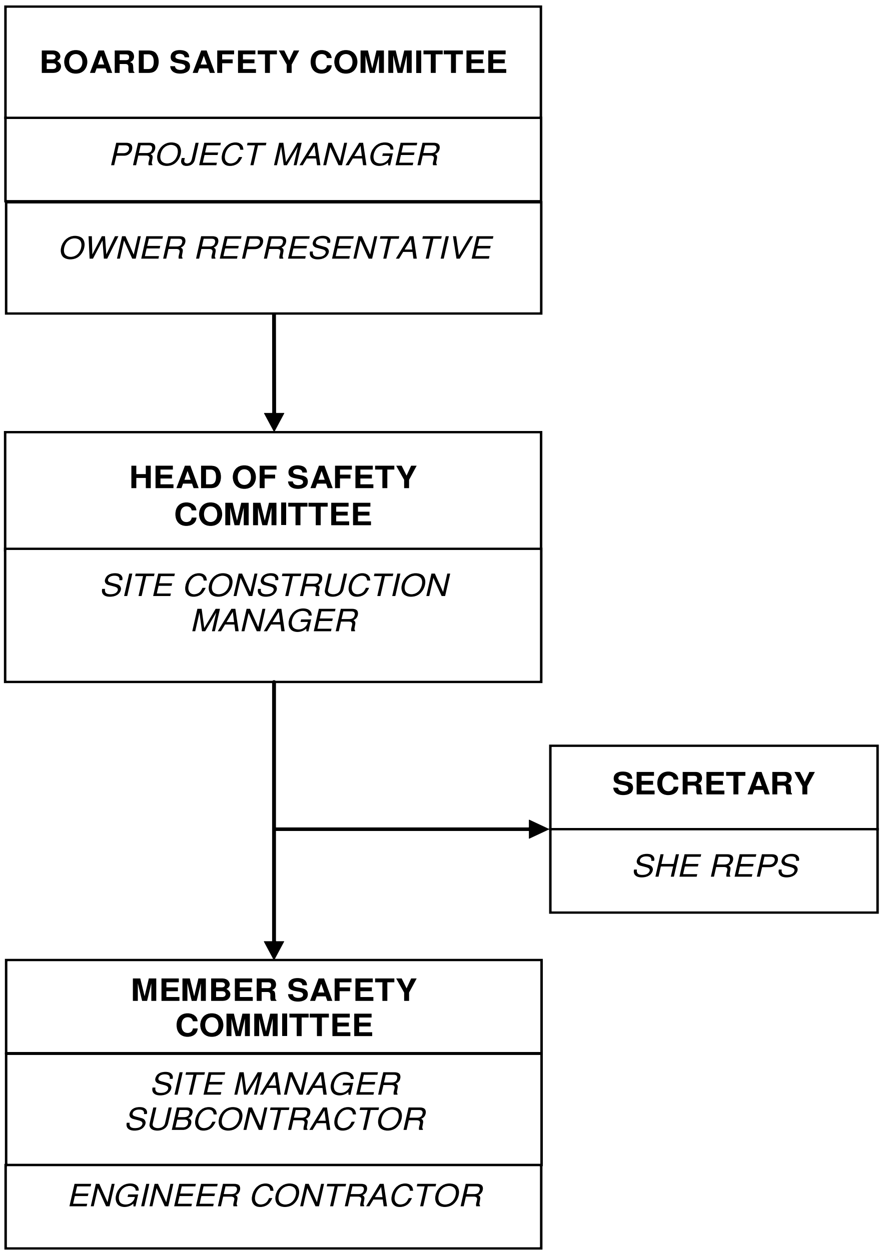


The project site organization structure is depicted above. The typical key positions are Site Construction Manager, Field Administration Manager, Site SHE Representative, Security Supervisor, Field Relations, and Field SCM.

4.3 SHE COMMITTEE

Each major activity shall have a SHE Committee that consists of the Managers and SHE Representative from Company, Contractors and Subcontractors.

SHE COMMITTEE ORGANIZATION



5 RESPONSIBILITY OF KEY PERSONNEL

5.1 PROJECT MANAGER / DRILLING MANAGER

a. Enforce and implement SHE Procedures (WP) and Work Instructions (WI) to ensure SHE control and compliance related to activities at SUPREME ENERGY sites.

b. Ensure compliance to legal and other requirements.

c. To ensure development of SHE Procedures and Work Instruction.

d. Identify significant aspects and impacts (hazards and risks) and ensure the implementation of appropriate control measures.

a. To provide all necessary equipment, personal protective equipment (PPE) and proper attire to they're workers including Sub-Contractor's workers.

b. To provide adequate SHE training to their workers required to perform the work safely.

e. To report all accidents / incidents immediately direct to SHE Organization / SHE Committee / Representative.

f. Monitor SHE performance and routinely report to the COMPANY.

5.2 SITE CONSTRUCTION MANAGER / SITE SUPPORT MANAGER / DRILLING SUPERVISOR

a. To assist the Project Manager in all levels / areas of implementing the SHE Management System at site.

b. Site Construction Manager is the top leadership / chairman of the site safety committee.

c. Bear responsibility of maintaining the safety of all personnel in the workplace.

d. Has authority to stop any operation or activity that constitutes a hazard to personnel or could result in loss of equipment or facility and environment.

e. To investigate and report all incidents / acccidents to SUPREME ENERGY representative.

f. Carry out the approved SHE program for the work / project.

g. Authorized to take necessary action against SHE violation by other Contractor's or Subcontractor's personnel.

h. To be a good role model of SHE to the subordinates.

i. To comply with related Agreement.

5.3 CONTRACTOR MANAGEMENT / SUPERVISOR

a. To ensure workplace are safe for conducting the work.

b. To prepare JSA and consult with SHE Department in task / job responsibilty.

c. To ensure that all persons reporting to them are trained in Work Instructions (WI) and ensure compliance to SHE Procedures (WP) / Work Instructions (WI) which are related to their activities.

d. To report all unsafe acts and unsafe conditions to their superior immediately.

e. To report all accidents / incidents in their area and related areas to their immediate superior.
f. To ensure all personal protective equipments (PPE) are worn.
g. To maintain good housekeeping and physical arrangements.
h. To attend all SHE trainings and meetings when requested.
i. To participate in SHE Inspections / Audits

5.4 OTHER CONTRACTOR EMPLOYEES

a. To comply with related Procedures (WP) / Work Instructions (WI) that is related to their activities.
b. To assist in any accidents / incidents investigation in their area.
c. To maintain good housekeeping and physical arrangements.
d. To ensure all tools and equipment are suitable for the work being performed and free from defects.
e. To attend all SHE training and meeting requested by the Contractor Management.
f. To use all required personal protective equipment (PPE).

5.5 SITE SHE REPRESENTATIVE

a. Assist Project and Drilling Management in providing risk assessment related to SHE aspects.
b. Overall management of the SHE training.
c. Train Project and Drilling Key Personnel in applying SHE system
d. Ensure workplace are safe for conducting the work.
e. Conduct routine SHE Inspection and Audit to ensure that all SHE activities at site are implemented.
f. To identify local legal and other requirements.
g. To establish related Procedures (WP) and other related documents on SHE.
h. Ensuring all SHE procedures are available at the work site.
i. Administration of SHE documentation & maintaining statistic on SHE matters for the project / activity (man power, man hours, first aid case, medical treatment case, lost time injury, fatality, vehicle accident, SHE inspection, safety talk, work permit record, etc).
j. To coordinate and investigate all incident / accidents which has happened in the workplace.

k. To conduct training and education programme for Site SHE Committee members.

l. To administer Site SHE Committee and become secretary of the Site SHE Committee.

5.6 SHE COMMITTEE CHAIRMAN (SITE CONSTRUCTION MANAGER / DRILLING SUPERVISOR)

a. To chair Site SHE Committee Meeting.

b. To select Site SHE Committee members.

c. To plan overall schedule of SHE Management Programme(s) to achieve the planned Objectives and Targets.

d. To plan the budget and seek for approval if necessary for implementation and improvement activities.

e. To coordinate team members participation and identify improvement through brainstorming.

f. To implement and monitor progress of SHE Objectives and Targets.

g. To take necessary corrective and preventive action to achieve SHE Objectives and Targets.

h. To ensure the availability of related Work Instructions (WI), conduct training and education for related personnel.

i. To ensure compliance to legal and other requirements.

j. To present SHE Objectives and Targets during Site SHE Committee Meeting, and Management Review Meeting.

k. To communicate Safety Committe decision to all workforce.

l. To communicate audit findings to all party concerned and submit the audit report for Management Review.

5.7 SITE SHE COMMITTEE MEMBER

a. To promote cooperation amongst all levels of management.

b. To conduct workplace inspection.

c. To prepare, review and update SHE Management Programme(s), activities and related documents.

d. To keep under review the measures taken to ensure implementation of SHE in the company.

e. To study the trends of accidents / incidents data.

f. To review the effectiveness of SHE management system and programme(s).

g. To investigate any accidents / incidents at the worksite.
h. To ensure all recommendations / corrective actions are fully implemented.
i. To attend any meeting and training related to SHE issues.
j. To prepare schedule action plan of SHE program.
k. To conduct internal SHE audits.

6 DOCUMENTATION AND DATA CONTROL

Contractor shall establish and maintain all information related to SHE Management System in paper or electronic form.

All SHE issues will be documented and the records maintained at the job site. All documentation and records should be :

- Legible
- Identifiable and retrievable..
- Stored and maintained to avoid loss or damage for a certain period.

Documentation and records will include:

- Environmental and Injury incident and investigation report.
- Loss prevention records.
- Equipment inspection records.
- Non-conformance and corrective actions.
- Training records.
- Induction records.

The following statistical records will be maintained and recorded and will be documented in the written minutes from the weekly review meetings:

- Total Man Power
- Total Man Hour
- SHE activities (inspection / audit,induction, safety talk, etc)
- Incident / accident case (first aid, medical treatment, loss time, fatality, vehicle, environment, etc)

The Contractor's Chief SHE will maintain statistical data in the statistic board SHE summary. A copy of this statistical data will be submitted to SUPREME ENERGY and Contractor home office on a monthly basis.

7 SAMPLE OF PROJECT SAFETY HEALTH AND ENVIRONMENT MANAGEMENT PROGRAM

No	SHE Activity Plan / Expectation	Procedure / Appendix Reference	Tools	What's to be done?	How do we check?	Frequency	Primary Responsibility
V.1	**Communicate CONTRACTOR SHE Policy and procedures to all employees, sub-contractors, client and other stakeholders as appropriate to ensure they aware of their obligations with respect to CONTRACTOR'S operation.**						
1	Conduct orientation / induction for employees, subcontractors and visitors to the site		Project Induction Guideline	Induction to all EMPLOYEES, including subcontractor staff and visitor	Personal induction record is maintained.	New hire employees, transferred employees and visitor	Site Construction Manager, Field Administration Manager and Site SHE Representative
			Project Staff Induction Record				Contractor Management
							Contractor's Chief SHE
2	Conduct regular meetings with Company, subcontractors and employees to discuss SHE issues		Daily Tool Box Meeting	A SHE discussion for each group on worker readiness, work plan for that day and possible JSA.	Record of Daily Tool Box Meeting for attendance and topics.	Every starting of shift work	Supervisor
					Site top management have to attend this daily tool box		
			Weekly Construction Meeting	Construction progress coordination and discussion meeting, include SHE issues	Minutes of meeting record with SHE as the first agenda	Weekly	Site Construction Manager
			Safety Committee Meeting	Discuss SHE issues and Project progress	Minutes of Meeting of record and attendance record	Monthly	Site Construction Manager
3	Conduct periodic basic safety training to communicate safety to all employees of contractor and subcontractor to communicate our safety expectation		Basic Safety Training	All project personal	Basic Safety attendance record	Minimum 1 time a year.	Project Manager, Site Construction Manager. Contractor's Management and Contractor's Chief SHE
4	Ensure employees receive safety training appropriate to their task and responsibility		Internal Training Course	Training Nomination Form must be filled out prior to any training taking place	Form to signed off by Project Manager prior to training taking place	Every time proposing to attend a course	Site Construction Manager and SHE Representative
			Training Attendance Sheet	Records have to be kept of all persons attending training	Training attendance sheet completed	At every training course	Contractor Management and Chief SHE

No	SHE Activity Plan / Expectation	Procedure / Appendix Reference	Tools	What's to be done?	How do we check?	Frequency	Primary Responsibility
			Training Register	Records have to be kept of all persons attending training	Training attendance sheet completed	At every training course	Project SHE Officer or SHE Supervisor
5	Establish SHE promotional material to improve the employee awareness		Safety Notice Board	Display all policies, Safety minute of meeting, review result of inspection, incidents, audits and others	Safety notice boards are placed in each work areas and displaying	Monthly	Project SHE Officer or SHE Supervisor
			Safety Performance boards	Display project performance review against its objective and target	Safety performance board placed in infront of REK office and displaying project performance review result	Update Weekly	Project SHE Officer or SHE Supervisor
			Safety Alerts	A Safety Alert shall be produced for high actual or potential incidents	Safety Alerts produced and displayed	Each occurence	Project Manager, Construction Manager, Project Chief SHE or SHE Superintendent or SHE Manager
				Follow up all relevant corrective action of incoming safety alerts from other projects	Follow up action incorporated into the Project SHE Plan	As Job condition require	Project Manager, Constructon Manager, Project Chief SHE or SHE Superintendent or SHE Manager
			Cautionary and Warning Sign	Develop and display relevant cautionary and warning sign (list of warning sign like tape barricade, etc)	Cautionary and warning signs developed and displayed on the hazardous work places	Once when it's determined	General Superintendent
V.2	**Comply with all applicable SHE laws, regulations, and statutory obligations.**						

No	SHE Activity Plan / Expectation	Procedure / Appendix Reference	Tools	What's to be done?	How do we check?	Frequency	Primary Responsibility
1	Ensure that we are fully informed of all applicable health and safety laws, regulations, statutory obligations and Company Safety requirement and comply with those laws and regulation		Legal Gap Analysis	Review all relevant legal aspects project such as: relevant statutory requirements, contractual requirements and Company SHE requirements	Legal Gap Analysis is developed and reviewed. Project procedures or working instruction may be developed to fill the gap	At start of project and as a result of any amendments to legislations and client requirements	Project Manager, Construction Manager, Project Chief SHE or SHE Manager
2	Keep abreast of any changes in laws, regulation		Government decrees, articles and amendments	Review all changes of those government reference	The changes are identified with a specific mark in the Legal Gap Analysis	Whenever required	Construction Manager
V.3	**Ensure that health and safety management and practices are incorporated into all aspects of Contractor operations**						
1	We will analyze all areas of our activity and identify the risk rank		JSA & Risk Assessment	Identify all common hazards and risks, which are associated with each project activity	Conceptual Risk Assessment is developed	At start of project / every starting of job	Project Supervisor
2	Where those procedures are not applicable or suitable develop, implement and maintain specific workplace procedures to ensure operations are conducted in such a manner that eliminates the risk of injury, illness or damage.		Job Safety Analysis	JSA must be completed for new jobs and high-risk jobs.	Completed JSA	Prior to start of the jobs	Project Supervisor
			JSA Review	Ensure all JSA's are suited to jobs carried out	JSA Review report	During the job in progress	SHE Supervisor
			Workplace Hazard Inspection	Carry out workplace hazard inspection for each project work area	Checklist of workplace hazard inspection is completed, followed up and closed out	As per schedule	Project Supervisor and Chief SHE or SHE Superintendent
V.4	**Seek to achieve the personal commitment of all employees, sub-contractors and suppliers to SHE workplace practices.**						
1	Instigate a workforce safety performance incentive scheme		Project Safety Incentive Scheme	Safety Incentive criteria is established and communicated	Safety Performance is monitored and reviewed by committee	Monthly	Construction Manager
				Award available for Zero Lost Time Injury	Budget for Bonuses are allocated	Every 1.000.000 man-hours with out lost time injury	Construction Manager
2	Involve the workforce in the		Project Safety Committee	Regular meetings, which attended all member of project safety committee.	Minutes of meetings is produced and communicated.	Monthly	Project Manager and Construction Manager

No	SHE Activity Plan / Expectation	Procedure / Appendix Reference	Tools	What's to be done?	How do we check?	Frequency	Primary Responsibility
	implementation of the safety program through the formation of a worksite Safety Committee			Regular inspection, which are to carried out by all member of project safety committee.	A checklist for this inspection is developed and completed	Monthly	Chief SHE or SHE Superintendent
3	Provide Leadership on all issues of safety management		Workplace Hazard Inspection	All signatories carried out a workplace hazard inspection for their own area of responsibility	A checklist of this inspection is completed, followed up and closed out by relevant signatories, 85 % close out action	Monthly	Construction Manager, Project General Superintendent, Project Supervisor
			Project Safety Committee	All signatories take a part in Project Safety Committee, if appointed as a member of it	Signatories attended on meeting and recorded. Take a part on inspection	Monthly	Construction Manager
			Tool Box Meeting	All signatories involved in this meeting on their own area of responsibility	Signatories attended on meeting and recorded.	Daily	All Signatories. Project Supervisor and SHE Supervisor / Inspector.
			Safety Talks	All signatories involved in this meeting.	Signatories attended meeting and record	Monthly	All Signatories. Project S/V and SHE S/V or Inspector.
			Weekly Construction Meeting	All signatories involved in this meeting , with "safety" as the first agenda of meeting.	Signatories attended on meeting and recorded.	Weekly	Construction Manager
			Internal Safety Audit	All signatories carry out Internal Safety Audit (including sub-contractors)	Internal Safety Audit record	Monthly	Construction Manager, Project General Superintendent, and Chief/Superintendent or SHE Manager.
V.5	**Provide SHE risk management systems and procedures that are relevant to the nature and scale of work undertaken**						
1	Ensuring that operations are carried out according to standard Company's approved procedures		Standard Instruction	Developing specific standard instruction or review existing or template standard instruction to be suited to the works	Standard Instruction is developed, communicated and maintained	All works shall covered by standard instruction	Project General Superintendent, Project Supervisor, and SHE
			Work Permit	A restriction and limitation to personnel in carrying out the works known as a high risk	Excavation Permit, Working at Height Permit, Radiography Permit, Hot Work Permit, Entry Into Confined Space Permit, Electrical Work Permit, Crane Permit, Cold Work	As required	Project General Superintendent, Project Supervisor, and SHE Supervisor
			Job Safety Analysis (JSA)	JSA must be completed for new jobs, risk jobs, or jobs that are not covered by SOP or Standard Instruction prior to commencement	Completed JSA (Job Safety Analysis)	Prior to commencement of the jobs	Project Supervisor

No	SHE Activity Plan / Expectation	Procedure / Appendix Reference	Tools	What's to be done?	How do we check?	Frequency	Primary Responsibility
			JSA Review	Ensure all the jobs are carry out in accordance to JSA	JSA Review report, Updated JSA revision number	During the job in progress	SHE Supervisor
			Pre-start inspection	Inspection of all equipment and tools must be carried out before mobilize to site	Checklist completed	Before mobilize to site	SHE and Project Supervisor
2	Risks to health, safety and environment will be dealt with by elimination, or removal, substitution, design, redesign, or separation, administrative and personal protection		Pre-start inspection	Inspection of all equipment must be carried out	Checklist completed	Before mobilize to site	Operators, Project supervisor
			Preventive Maintenance Inspection	All plant and equipment are scheduled for maintenance	Checklist completed	As per Schedule	Project GSI and Mechanical Supervisor
			Workplace Hazard Inspection	Carry out workplace hazard inspection regularly	A checklist of this inspection is completed and closed out	weekly	Project Supervisor and SHE Supervisor
3	Provide risk identification and management in the work areas		Job Safety Analysis	JSA must be completed for new jobs, risk jobs, or jobs that are not covered by SOP or Standard Instruction.	Completed JSA	Prior to commencement of the jobs	Project Supervisor
			JSA Review	Ensure all the jobs are carry out suited to JSA	JSA Review report, Updated JSA revision number	During the job in progress	SHE Supervisor
			Hazard Reporting	Supervisory staff to enforce the reporting of hazards that may arise before, during and after the works	Hazard report is produced. Hazard register is maintained. Corrective Action is recorded	Every Day	Project Supervisor, SHE Inspector
4	Ensuring that operations are carried out according to applicable environmental standards		Standard Instruction	Developing environment standard instruction or review existing or template environment standard instruction to be suited to the works	Standard Instruction is developed, communicated and maintained	All works shall covered by standard instruction	Project General Superintendent, Project Supervisor, and SHE Supervisor.
V.6	**Set measurable targets and seek to continually improve our SHE performance**						
1	Set the Safety Performance targets for the project		Project Safety Performance Target	To do better that the corporate target: LTIFR <0,7 and LTISR <0,7, with Fatality=0, Property Damages < 0, First Aid < 10	Safety Statistic Performance	Monthly	Construction Manager
				Corporate SHE Audit compliance rate minimum 90	Target is reviewed and communicated	As per schedule	Construction Manager
				Audit internal project minimum 1 sub-contractor per month	Target is reviewed and communicated	Monthly	Construction Manager
V.7	**Periodically review and revise our SHE Policy and procedure to maintain CONTRACTOR relevance**						
1	Conduct assessment and review of key personal SHE in		Assessment SHE Management System Checklist	Formal review of the implementation SHE Management System and performance Project Manager or Chief SHE	Action plan from the review	Every 2 months or as required	Corporate SHE Manager and GM QC-SHE

No	SHE Activity Plan / Expectation	Procedure / Appendix Reference	Tools	What's to be done?	How do we check?	Frequency	Primary Responsibility
	implementing SHE Management System						
2	The Plan will be audited regularly		Corporate SHE Audit	Corporate SHE audit shall be conducted on a regular basis	Corporate Audit Report	As per schedule	Construction Manager
			Internal Safety Audit	Every workplace shall be audited against the SHE plan by internal audit	Internal site SHE audit	Monthly	General Superintendent and Project Chief SHE or SHE Manager
VI.8	**Prepared for emergencies and response quickly, effectively and with care to incidents resulting form CONTRACTOR operation**						
1	Undertake and establish Emergency Preparedness		Emergency Response Plan	Develop emergency response plan and maintain its preparedness and equipment	Plan are regularly reviewed. The preparedness emergency equipment is checked regularly	Every Six-Month	Construction Manager, Project Chief SHE or SHE Superintendent
			Emergency Response Training	Ensure all personnel involved in Emergency Response Team have been trained in ERP	ERP induction will be given to Contractor representative and shall be trickled down to all Contractor employees by Contractor.SHE representative	Before project start	Company and Contractor SHE Representative
			Emergency Rehearsal	Practice the Plan by simulating an emergency situation	A written emergency rehearsal report	Quarterly	Project Manager, Construction Manager and Project Chief SHE or SHE Superintendent
			Site Medical Services and	First Aid Facilities to manned per day (Working Hours) by trained medic /	Medical Kit is maintained and completed	Every Week	Paramedic / Medical Officer
			First Aid Training	Minimum of 10% of workforce and or ERP Team	Review Training Record	As per schedule	Construction Manager, Chief SHE or SHE Superintendent
			Rehabilitation Plan	Ensure that rehab plan is developed and agreed to by employee	Completed Rehab Plan	Every Rehabilitation Case	Construction Manager, Project Chief SHE or SHE Superintendent
V.9	**Health : Prepared for Exercise Program**						
1	Conduct Exercise Program		Gym or Exercise	All signatories involved in this Gym or Exercise	Signatories attended this Gym or Exercise	Weekly	Construction Manager, Project Chief SHE or SHE Superintendent
V.10	**Rules and Regulation At Site**						
1	Require not to smoke at office site and working area ; prohibit use drug and alcohol and carry weapon		Safety Notice Board and Project Induction	Contractor staff, Subcontractor staff and visitor	Result of Monitoring	Monthly	Construction Manager, Project Chief SHE or SHE Superintendent
V.11	**Selection of Subcontractor**						
1	Conduct selection our		SHE Questioner	All sub-contractor	Result of questioner	Validity every 2 years	Project Manager, Project

No	SHE Activity Plan / Expectation	Procedure / Appendix Reference	Tools	What's to be done?	How do we check?	Frequency	Primary Responsibility
	sub-contractor		(CSMS)		High Risk Category > 50, 35 – 50 : Low Risk Category		Procurement Manager and Project Manager SHE
V.12	**Accident Investigation and Reporting**						
1	Conduct Accident Investigation		Accident Investigation Form	All Major Accident and Minor Accident (First Aid)	Completed Accident Investigation Form	As per Event	Chief SHE or SHE Superintendent, Construction Manager
2	Regular report Accident		Accident Reporting Form	All Major Accident and Car Accident	Completed Accident Reporting Form	1 x 24 Hours	Chief SHE or SHE Superintendent
V.13	**Safety Awareness Program**						
1	In encourage Safety Behavior Awareness, will request to all employee to report all unsafe act and unsafe condition		Unsafe Act and Unsafe Condition Form	All unsafe act and unsafe condition	Completed Unsafe Act and Unsafe condition Form	Every Day	All employees
2	In monitoring implementation SHE Management System at project site. Request project team to provide SHE Report	None	SHE Report Form	Implementation of SHE Management System, Man-Hours, Man-power, Total Accident for all employees of Contractor and Subcontractor	Completed SHE Report Form	Monthly	Chief SHE or SHE Superintendent
V.14	**Health Program**						
1	Conduct General Medical Check-up for all new employee of Contracor	Project Spec	General Medical Check-up Form	All employee of Contractor who is assigned to the Project	Result of General Medical Check-up	As require	Project Manager and Construction Manager
2	Conduct Pest Control/ Industrial Hygiene Control	Project Spec	Record of implementation the insect and pest nuisance	Contractor and Sub contractor Camp facilities and Work Area	Check the record	Every 3 month or more often depend on Government Authority requirement.	Paramedic

No	SHE Activity Plan / Expectation	Procedure / Appendix Reference	Tools	What's to be done?	How do we check?	Frequency	Primary Responsibility
3	Conduct Canteen Inspection	Project Spec	Canteen Inspection Form	Canteen Facilities	The food hygiene and nutrition	Every 3 month or more often depend on Government Authority requirement.	Paramedic

V.15 PROJECT ENVIRONMENTAL OPERATION PROGRAM

No	Environmental Activity Plan	Procedure / Appendix Reference	What's to be done?	How do we check?	Frequency	Primary Responsibility
1	Waste Management Control	UKL / UPL ; EIA Document and RKL / RPL of AMDAL	Control the schedule waste management (Hazardous Chemical Material) and provide MSDS at site.	- Master List and inventory of scheduled waste, - Storage of schedule waste, - Company for handling waste schedule must registered by Government.	As required	Construction Manager. Project Chief SHE or SHE Superintendent General Superintendent
			Control the non-schedule waste through organic and non-organic waste	Weekly monitoring form completed	Weekly	Project Chief SHE or SHE Superintendent General Superintendent
2	Liquid Spill Control	UKL / UPL ; EIA Document and RKL / RPL of AMDAL	Provide oil container and oil traps by the site drainage	Monitoring form completed	Monthly	Construction Manager , Project Chief SHE or SHE Superintendent
3	Social Impact Management	Client requirement ; UKL / UPL ; EIA Document , and RKL/	Conduct Community Development	Activity Report	as required	Construction Manager , Project Chief SHE or SHE Superintendent, and Project COMDEV Coordinator
		Client requirement ; UKL / UPL ; EIA Document , and RKL/ RPL of AMDAL	Conduct conflict management and response management	Conflict Report	as required	Construction Manager, Project Chief SHE or SHE Superintendent, and Project COMDEV Coordinator
4	Environmental Control and Monitoring	UKL / UPL ; EIA Document and RKL / RPL of AMDAL	Conduct Protection of all the environmental requirement (noise, dust, air pollution, erosion and land slide, liquid waste, water pollution and so on)	Monitoring form complete	as required	Construction Manager, Project Chief SHE or SHE Superintendent
5	Communicate Contractor Environmental Policy & Procedure	4210-GP-13-02, 4210-GP-13-05. APPENDIX EE	All project Contractor staff, subcontractor staff and visitor	Induction record, Record daily tool box meeting, minute of meeting and attendance all SHE Meetings	As required	Construction Manager, Project Chief SHE or SHE Superintendent

No	Environmental Activity Plan	Procedure / Appendix Reference	What's to be done?	How do we check?	Frequency	Primary Responsibility
6	Establish Environmental promotional material to improve the employee awareness	None	Display in SHE notice board, in SHE performance board, produced environmental alerts and produced warning sign	Display all promotional material in best area	Refer to H&S Management Plan	Project SHE Supervisor
7	Analyze all areas of our activity and identify the risk rank		Identify all common hazards and risks, which are associated with each project activity use JSEA and Risk Assessment	Conceptual Risk Assessment is developed	At start of project / every starting of job	Project Supervisor
8	Instigate a workforce SHE performance incentive scheme		Incentive criteria is established and communicated	Performance is monitored and reviewed by committee	Monthly	Construction Manager
9	Ensuring that operations are carried out according to environmental standard		Developing environmental standard instruction or review existing or template environmental standard instruction to be suited to the work	Standard instruction is developed, communicated and maintained	All works shall covered by standard instruction	Project General Superintendent, Project Supervisor and SHE Supervisor
10	Undertake and establish emergency preparedness		Develop emergency response plan and maintain its preparedness and equipment	Plans are regularly reviewed. The preparedness emergency equipment is checked regularly	Once a year for Fire Drill and Twice a year for Emergency Response Drill	Construction Manager, Project Chief SHE or SHE Superintendent
11	Conduct accident investigation and reporting		All major and minor accident	Complete accident and investigation form	As per event for investigation and 1 x 24 hours for accident reporting	Project Chief SHE or SHE Superintendent, and Construction Manager
12	Rules & Regulation at site: No smoking, use drug and alcohol and carry weapon		All project Contractor staff, Subcontractor staff and visitor	Result of monitoring	Monthly	Project Chief SHE or SHE Superintendent, and Construction Manager
13	Encourage behavior awareness		All unsafe act and unsafe condition	Complete unsafe act and unsafe condition form	Every Day	All employees
14	Audit the plan regularly		Corporate SHE audit will conduct regularly and monthly audit for internal project site	SHE Audit report	As per schedule for corporate audit and monthly for internal audit	Construction Manager, General Superintendent, Project Chief SHE or SHE Superintendent, and SHE Manager

5 PROJECT'S SHE ACTIVITY PLAN

No	ELEMENT	PROGRAM /ACTIVITY	PIC	SCHEDULE																						REMARKS
				DAILY						WEEKLY				MONTHLY												
				Mon	Tue	Wed	Thurs	Fri	Sun	1st	2nd	3th	4th	1	2	3	4	5	6	7	8	9	10	11	12	
1	LEADERSHIP	Provide SHE Committee	Construction Manager	When starting project																						
		Monthly SHE Committee meeting	Construction Manager											√	√	√	√	√	√	√	√	√	√	√	√	every month
		Weekly SHE internal meeting with all SHE Spv and Inspector	Chief SHE / SHE Superintendent							√	√	√	√													on Monday, every week
		Provide emergency response organisation (fire and rescue)	Construction Manager	When starting project																						
2	TRAINING	Basic Safety Training	Mgr / Chief SHE												√											(state when)
		Basic First Aid	Paramedic													√										(state when)
		Regular Safety Training at Project Site:																								
		Behavior Base Safety (BBS)	Mgr / Chief SHE												√											(state when)
		Defensive Driving	Mgr / Chief SHE																						√	(state when)
		Scaffolding	Mgr / Chief SHE													√										(state when)
		Rigging and Lifting	Mgr / Chief SHE																	√						(state when)

No	ELEMENT	PROGRAM /ACTIVITY	PIC	SCHEDULE																						REMARKS
				DAILY						WEEKLY				MONTHLY												
				Mon	Tue	Wed	Thurs	Fri	Sun	1st	2nd	3th	4th	1	2	3	4	5	6	7	8	9	10	11	12	
		Job Safety Analysis	Mgr / Chief SHE															√						√		(state when)
		Electrical Safety	Mgr / Chief SHE																		√					(state when)
		Fire Emergency Evacuation	Mgr / Chief SHE																√							(state when)
		Gas Detector	Mgr / Chief SHE																	√	√					(state when)
		Basic First Aid	Mgr SHE														√									Before Assigned to Project (state when)
3	MANAGEMENT OF SUB-CONT	Standard Instruction socialization	Chief SHE							√	√	√	√													
		Key Performance Indicator Assessment	Chief SHE											√	√	√	√	√	√	√	√	√	√	√	√	every month (state what date)
		Conduct daily regular inspection	SHE Spv	√	√	√	√	√	√																	
		Area inspection	Chief SHE / SHE Superintendent							√	√	√	√													every week (state day)
4	SHE IN CONSTRUCTION ; COMMISIONING ; DRILLING	Provide JSA, Risk Analysis, Quality Plan, Rigging Plan, Construction Method and Provide Drawing Activity Area for all activities	Spv/SI	Based on project site activities																						

No	ELEMENT	PROGRAM /ACTIVITY	PIC	SCHEDULE																						REMARKS
				DAILY						WEEKLY				MONTHLY												
				Mon	Tue	Wed	Thurs	Fri	Sun	1st	2nd	3th	4th	1	2	3	4	5	6	7	8	9	10	11	12	
		Establish work permit for SHE operation control	Chief SHE	Based on project site activities																						
		Domestic waste and chemical material management	Chief SHE											√	√	√	√	√	√	√	√	√	√	√	√	3th week, every month
		Environmental Monitoring & Control	Mgr / Chief SHE	Based on UKL / UPL ; EIA (AMDAL) requirements																						
		Pest Control / Industrial Hygiene Control	Paramedic											√			√			√			√			Every Three Month
		Canteen Inspection	Paramedic											√			√			√			√			Every Three Month
		Fume and Dust Monitoring	Mgr / Chief SHE														√							√		Two Times a year
		Daily Hazard Assessment	SHE SI / SHE Supv	√	√	√	√	√	√																	Daily reporting
5	INSPECTION	Daily work area inspection	SHE Spv	√	√	√	√	√	√																	Daily reporting
		Weekly plan inspection	Chief SHE							√	√	√	√													every week (state what day)
		Fire extinguisher inspection	SHE Spv											√	√	√	√	√	√	√	√	√	√	√	√	every month (state what date)
		PPE inspection	SHE Spv											√	√	√	√	√	√	√	√	√	√	√	√	General safety talk 3rd week
		Equipment inspection before delivery to project site	Mgr / Chief / Superintendent SHE	Based on project site needs																						

No	ELEMENT	PROGRAM /ACTIVITY	PIC	SCHEDULE																						REMARKS
				DAILY						WEEKLY				MONTHLY												
				Mon	Tue	Wed	Thurs	Fri	Sun	1st	2nd	3th	4th	1	2	3	4	5	6	7	8	9	10	11	12	
		Heavy equipment inspection at project site	SHE Spv											√			√			√			√			Every Three Month
		Cable and Sling inspection	SHE Spv																							Every xx months (state when and what color)
		Machinery Inspection	SHE Spv												√		√		√		√		√		√	Every Two Month
		Hose for Pressure Bottle Inspection	SHE Spv							√	√	√	√													Every Week
		Hand Tool Inspection	SHE Spv												√		√		√		√		√		√	Every Two Month
6	COMMUNICATION	Safety induction and training (Basic Safety Training) for new employee and visitor	Mgr / Chief SHE	Based on project site needs																						
		Daily Tool Box Meeting	Spv or Foreman	√	√	√	√	√	√																	Before starting the jobs
		Weekly general safety talk	Chief SHE / SHE Superintendent							√	√	√	√													Before starting the jobs
		SHE Committee meeting	Project Manager											√	√	√	√	√	√	√	√	√	√	√	√	2nd week every month

No	ELEMENT	PROGRAM /ACTIVITY	PIC	SCHEDULE																						REMARKS
				DAILY						WEEKLY				MONTHLY												
				Mon	Tue	Wed	Thurs	Fri	Sun	1st	2nd	3th	4th	1	2	3	4	5	6	7	8	9	10	11	12	
		Safety promotion by banner, safety sign board & bulletin	Chief SHE / SHE Superintendent											√	√	√	√	√	√	√	√	√	√	√	√	1st week, every month
		Safety statistic board	SHE Spv							√	√	√	√													1st week, everyweek
		SHE Observation card (pelaporan UA & UC) program	SHE Spv & SHE Superintendent	√	√	√	√	√	√																	Summarized every week
7	EMERGENCY RESPONSE	Provide fire and emergency rescue team	Mgr / Chief SHE	When starting project																						
		Conduct Emergency Response drill	Construction Manager														√								√	State frequency (at least once a year or once during the project)
		Conduct fire drill	Construction Manager														√						√			Conducted twice a year
8	INVESTIGATION AND ACC. REPORT	Conduct Accident investigation for minor and major injury	Mgr / Chief SHE																							If Accident Happen
		Report minor and major injury (1x24 jam)	Chief SHE / SHE Superintendent																							If Accident Happen

No	ELEMENT	PROGRAM /ACTIVITY	PIC	SCHEDULE																						REMARKS
				DAILY						WEEKLY				MONTHLY												
				Mon	Tue	Wed	Thurs	Fri	Sun	1st	2nd	3th	4th	1	2	3	4	5	6	7	8	9	10	11	12	
9	DOCUMENTATION	Provide weekly SHE activities report	SHE Spv & SHE Superintendent							√	√	√	√													The end of the week
		Provide monthly safety report	Mgr SHE											√	√	√	√	√	√	√	√	√	√	√	√	
		Review SHE Documenta-tion System	Mgr SHE											√	√	√	√	√	√	√	√	√	√	√	√	the end of the month
10	AUDIT AND EVALUATION	SHE Monthly evaluation to sub-contractor	Mgr / Chief SHE											√	√	√	√	√	√	√	√	√	√	√	√	first of the month
11	REWARD AND PUNISHMENT	Award to all employees for 1.000.000 million hour without Lost Time Injury	Construction Manager	Base on Man-Hours Project																						
		Award to the sub-contractor that show good performance in Monthly Evaluation	Construction Manager											√	√	√	√	√	√	√	√	√	√	√	√	last week of the month
		Monthly award to employee that show safety behaviour / reporting UA/UC	Construction Manager											√	√	√	√	√	√	√	√	√	√	√	√	last week of the month

No	ELEMENT	PROGRAM /ACTIVITY	PIC	SCHEDULE																						REMARKS
				DAILY						WEEKLY				MONTHLY												
				Mon	Tue	Wed	Thurs	Fri	Sun	1st	2nd	3th	4th	1	2	3	4	5	6	7	8	9	10	11	12	
		Punishment to Sub-contractor and employee who give bad SHE performance	Chief SHE											√	√	√	√	√	√	√	√	√	√	√	√	

8 ATTACHMENT 1: CONTRACTOR OBLIGATIONS IN OCCUPATIONAL HEALTH AND SAFETY

CONTRACTOR OBLIGATIONS IN OCCUPATIONAL HEALTH AND SAFETY

Contractor shall be committed to conduct its operation in a manner that protects the safety of its employees, customers, contractors and the public.

Contractor shall strive to prevent accident, injuries, and occupational illness through the active participation of every employee.

Contractor shall be committed to continuous efforts to identify and eliminate or manage safety risks associated with its activities.

Therefore the Contractor shall :

- Comply with the relevant SHE legislation, regulation and any other associated requirement.
- Stress to all employees, Sub-contractors and other working on Company's behalf, their responsibility and accountability for safe performance on the job.
- Provide adequate instruction, training, and supervision of work.
- Set SHE objective and targets to achieve superior performance through the utilization of a continuous improvement process.
- Ensure that systems are developed and implemented to identify, assess, monitor, periodically review and control impacts related to Company business activities.
- Implement mechanisms to communicate with and obtain input from Company, employees, and Sub-contractors within the SHE Management System.
- Provide or arrange for medical services necessary for the treatment of employee occupational illness or injuries and for handling of medical emergencies.

Contractor shall recognize that the achievement of an effective Occupational Health and Safety Program demands the active and positive on going involvement of personnel at all levels.

ATTACHMENT 2

CONTRACTOR OBLIGATIONS IN ENVIRONMENTAL PROTECTION

Contractor shall conform to Company requirements ; UKL / UPL ; Environmental Impact Assessment Document , and RKL/ RPL of AMDAL. Contractor shall also meet the Government environmental regulations applicable to the work to be performed.

To realize this goal, Contractor will:

- Assess the environmental sensitivity of potential operating sites and the impact of our operations on the local and regional environments.
- Limit waste generation, discharge and emission by handling the risk of spills, leaks and accidental discharges.
- Maintain emergency preparedness plans and response capabilities.
- Demonstrate commitment through environment excellence.
- Be responsive to public attitudes and concerns.
- Commit appropriate means and resources to meet stated goals and standards to comply with applicable laws and regulations.
- Ensure that inspections, audits, reviews and follow-up actions are planned and carried out.
- Encourage concern and respect for the environment and emphasize every employee’s responsibility for environmental performance to ensure appropriate operating practices.

ATTACHMENT 3
ALCOHOL, DRUG AND CARRY WEAPON POLICY

Contractor shall be committed to provide a safe, healthy, and productive workplace.

Company worksite where Contractor perform its job shall be free of alcohol, drugs, and weapon and banned substances. The misuse of legitimate drugs, alcohol and carry weapon or the use or possession of banned or controlled drugs on Company premises, is strictly prohibited.

Any employee taking prescribed drugs shall notify the Contractor’s physician or medic to verify if he can work whilst under the influence of such medication.

Company reserves the right to conduct searches or perform tests to determine the presence of alcohol or drugs or carry weapon. Contractor employees who refuse to submit to alcohol and/or drug testing may be subject to disciplinary action which may lead to termination of employment.

supremeenergy	SAFETY HEALTH AND ENVIRONMENT WORK RULES	PROCEDURE
CORPORATE	EXCAVATION AND SHORING	SE-MSHE-WOR-PRO-0003 Revision: 0

APPROVAL

	POSITION	NAME	SIGNATURE	DATE
Prepared by	SHE Engineer	Erwin Patrisa Floris		
Reviewed By	Sr. SHE Manager	M. Arief Tarunaprawira		
Approved By	VP. Relation & SHE	Priyandaru Effendi		17/05/2013

REVISION HISTORY

REV	DATE	BY	REVIEWED	APPROVED	DESCRIPTION
0					For Use

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1. INTRODUCTION

Excavating is recognized as one of the most hazardous construction operations. Workers may be exposed to hazards created when excavated surfaces become unstable. Hazards may also be created by the presence of underground installations, hazardous atmospheres, falling material and water accumulation. Engineering controls must be utilized to protect workers from these hazards.

The identification and control of hazards in all trenching work is not a simple matter. The physical hazards no longer lie on the surface, accessible to a simple inspection. There is no single ideal system of control. The most appropriate systems may vary to some extent with the type of trenching work carried out.

All trenching work is potentially hazardous. Attention must be paid at all times to considerations of safety by everyone involved in trenching operations.

This procedure applies to all excavations within SUPREME ENERGY operations, when soil is to be removed using powered equipment. It also applies when manually digging to a depth of 18 inches or more, except in the living accommodations area, where it applies when manual digging to a depth of 6 inches or more. It does not apply to well drilling.

This procedure outlines the minimum safety requirements that must be followed to ensure the safety of workers and facilities during excavation work.

2. DEFINITIONS

Excavation

(*means making a hole or channel by digging*) - is any cut, cavity, trench, or depression in the earth's surface that is created by removing earth by hand or using powered mechanical equipment.

Excavation Supervisor

The Person in Charge (PIC) of the excavation work and responsible for ensuring that conditions in the facility or area are safe for the excavation work to begin. The PIC is designated by the department or section that operates the facility or is otherwise responsible for safe operations in the excavation area.

Material

- Consists of or includes solid material in such a form or state, or in pieces or particles so small, that it is capable of subsiding or flowing in such a manner as to trap or engulf a person
- Is enclosed inside a structure.

Qualified Person

A person who, by possession of a recognized degree, certificate, or professional standing, or who by knowledge, training, or experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the subject.

Underground Services

Means all authorized services placed in the ground and controlled by a recognized authority. It does not include underground structures such as brick sewers, railway tunnels, etc.

Unforeseen Work

Means work that occurs at such short notice that it cannot be planned in advance.

Shoring

(*shoring system*) is a structure of metal, timber or both that supports the sides of an excavation to prevent cave-in. Shoring systems may be mechanical or hydraulic.

Angle of Repose

The angle to the horizontal at which the material in the face is stable and does not fall away.

Batter

The inclination of a slope, expressed as (a) vertical units or (b) horizontal units.

Benching

(benching system) means to form the excavation faces into one or a series of horizontal levels or steps to prevent cave-in, (a sloping ground in horizontal steps).

Face

An exposed sloping or vertical surface resulting from material.

Filling

Any ground made up using imported material or material from the excavation.

Safe Slope

The steepest slope at which an excavated face is stable against slips and slides.

Soil

All materials encountered from the ground surface to the bedrock.

Well Point System

A system of pipes, jetted or driven at close centers into the ground and connected to a suction main for the purpose of lowering ground water, particularly in granular soil.

3. RESPONSIBILITIES

3.1 Loose But Enclosed Materials

The person in charge of the excavation shall take all practicable steps to ensure that, where any employee can be trapped or engulfed by material, a safety belt or safety harness is provided that is:

- suitable for the purpose for which it is to be used
- attached to a life-line or other device
- securely fastened at its extremity
- attended by another employee who is competent, equipped, and stationed to affect an immediate rescue, if any employee is trapped or engulfed.

3.2 Raised Objects

The person in charge of the excavation shall take all practicable steps to ensure, where any employee is under any object/item that has been raised or lifted by any means to enable any work to be done, supports or other devices are placed or used under the object/item so that it cannot drop or be lowered while the employee is under it.

3.3 Excavations With Faces More than 1.5 Meters High

All practicable steps shall be taken to ensure that, where any face of any excavation is more than 1.5 meters high, that face is shored. A permit-to-work (Master Work Permit) is required for work more than 1.5m deep or where the material is unstable.

This does not apply where:

- the face is cut back to a safe slope
- the material in the face is of proven good standing quality under all reasonably foreseeable conditions of work and weather
- by reason of the nature of the work and the position of any employee in the vicinity, there is no danger to any employee
- the provision of shoring is impracticable or unreasonable by reason of the nature of the work and the contractor takes all practicable steps to ensure that other precautions are taken to make the face as safe as possible in the circumstances.

All practicable steps shall be taken to ensure that any shoring used in any excavation:

- consists of materials that are suitable for the purpose for which they are to be used, of sound quality, and adequate in strength for the particular use
- has bracing, jacks, and struts that are securely held to prevent accidental displacement, and packings and wedges that are held by nails or spikes
- is placed in a proper manner by an experienced person under competent supervision
- is not altered, dismantled, or interfered with except on the instructions of the person in charge of the excavation.

3.4 Excavations of Hazardous Depth

All practicable steps shall be taken to ensure, where any excavation is:

i. readily accessible to any person; or
ii. likely to collect or retain water of such a depth as to constitute a danger to any person,

The excavation is covered or fenced so no unauthorized person has access to it.

At completion of work the excavation shall be filled.

4. EXCAVATION PLAN

4.1 Plan Approval

A formal excavation plan shall be prepared by the contractor or SUPREME ENERGY staff member responsible for the excavation work. This should be on Form 18.1 as provided at the end of this section. It shall be submitted at least two days before the start of any physical work.

For each excavation an Excavation Supervisor shall be appointed who shall have authority and be personally responsible for the inspection, checking and maintenance of excavation work and safety. The Excavation Supervisor will carry out a formal inspection daily of the work and complete an inspection form (Form 18.2 at the back of this section).

The appointment of an Excavation Supervisor does not negate the responsibility of the rest of the staff for the work.

5. SAFE WORK PRACTICES

5.1 Introduction

SUPREME ENERGY will organize and carry out excavations in such a manner so as to eliminate, or at least minimize, inconvenience or damage to underground services whilst still providing safe conditions for both workers and the public.

SUPREME ENERGY will isolate the underground services from the excavation work in order to allow work to continue without danger to the workers or the public.

All excavation work must be planned before work commences on site. This is essential if the work is to be carried out safely.

Before work starts, there should be on-site, sufficient suitable materials to support the length of excavation expected to be open in normal circumstances, plus extra material that can be used if required.

The designer of a trench support system needs to bear in mind that the system is usually required to serve two purposes:

i) safety

ii) avoidance of damage to adjacent buildings, roads and services.

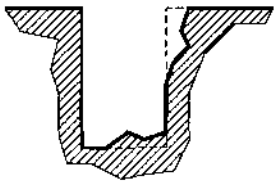
5.2 Modes of Failure

It should be noted that all excavations no matter what depth, may be hazardous. Modes of failure will depend on

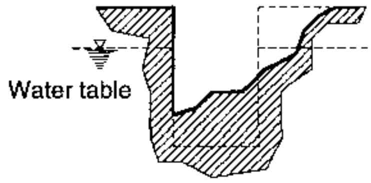
- the depth and type of soil
- bedding planes
- vibration
- the presence of moisture: rain, or a high water table level
- any superimposed loading close to the edge of the excavation
- the length of time the excavation is open
- any previous disturbance of the soil.

While some types of soil often look stable and may stand for quite a long time, a false sense of security can build up.

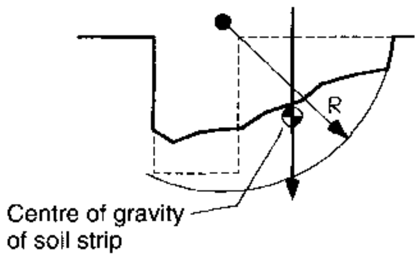
Some common failure modes are shown in Figure 18.1



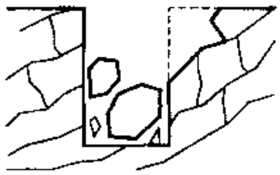
Unstable lumps fall into trench



Slump failure of soil mass



Rotational slip failure



Failure through slippage along bedding plans

Figure 18.1: Soil Failure Modes

Removal of soil from an excavation causes unbalanced soil stresses. The use of a shoring system, or the cutting of the sides of the excavation to a safe slope, will help compensate these soil stresses. A shoring system, or the design of safe side slopes, is engineering problems that involve both structural design and soil mechanics. While experience can guide operators in recognition of hazardous situations, it is only engineering practice that can provide known safe solutions. Just because a ‘solution’ worked previously does not mean that solution is satisfactory for the current situation. There may be additional factors that need to be taken into account.

5.3 Review of Site Plans

The owners of underground services shall be approached for information and plans well before excavation is due to start.

For major projects, an early approach to service owners is recommended as it may be possible to divert some services from the excavation area.

Plans shall be obtained which show the recorded line and depth of all their known services buried in the proposed work area.

Plans are not normally drawn to scale but even if they claim to be, they shall not be relied upon to obtain accurate measurements. However, plans can give a good indication of the location, configuration and number of underground services at a particular site.

Those in charge of site work, and operators of locators, shall be aware the plans may show spare ducts, and that the accuracy of plans is limited as:

- the position of reference points may have changed since the plans were drawn
- re-grading of the surface may mean that the depths shown are now incorrect
- services, particularly cables may have been moved without the authority or knowledge of the owners
- in many cases service connections are not marked
- services tend to be drawn as straight lines but may in practice 'snake'. Excessively long cables may have been laid as horizontal loops outside substations, switch rooms, etc.

Even when work has to start without plans, as may be the case for emergency and unforeseen work, every effort should be made to locate buried services.

Where plans are not available in any situation, hand digging only shall be carried out.

5.4 Locating Devices

The position of any services in or near the proposed work area should be pinpointed as accurately as possible by using a locating device, in conjunction with any available service plans or other suitable information.

Plans will help the operator using the locator to interpret the signal, and so give the maximum information to those involved with the work before digging starts.

The degree of confidence with which buried services can be detected depends on a number of factors such as the characteristics of the device being used, the type and depth of the service, the magnitude of the current carried by the cable or other service, and the effects of other cables and metal pipes close by.

Frequent and repeated use shall be made of locators during the course of work.

Locators will not detect plastic pipes or other non-metallic ducts and services unless either:

- a metallic tracer wire has been laid with the pipe
- a small signal transmitter is inserted into and pushed along the pipe.

Locating devices shall always be used in accordance with the manufacturer's instructions and shall be regularly checked and maintained in good working order.

5.5 CAT (Cable Avoiding Tool).

Before using the CAT at the work site, carry out a visual survey of the area, look for some of the following:

- overhead power lines
- street lighting
- cable poles
- housing in the area

- stop cock covers
- signs of previously dug trenches.

5.6 Safe Digging Practice

Once a locating device has been used and/or the services are located, excavation may proceed, with trial holes dug using hand tools as necessary to confirm the position of any buried service. Special care shall be taken when digging above or close to the assumed line of such services.

Where practical, power tools shall not be used within 0.5 meters of the indicated line of the buried service.

Power tools and machinery shall not be used until services have been located and identified by hand digging

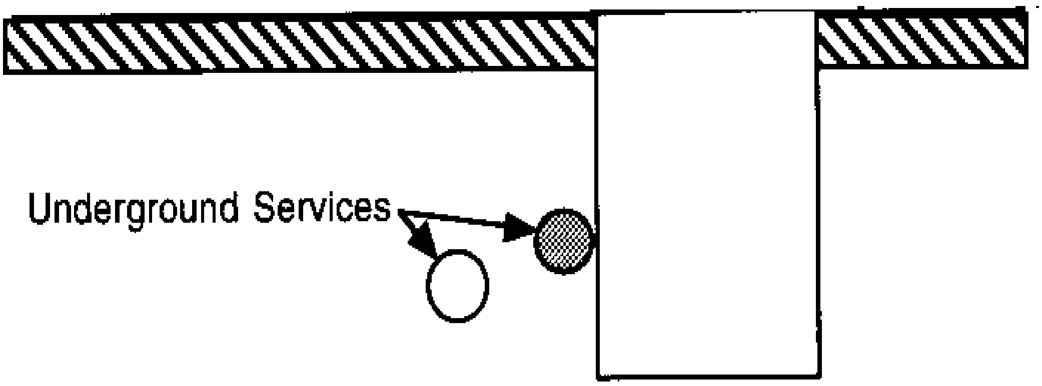


Figure 18.2: Excavating Next to Underground Services

When power tools have been used to break the surface away from the indicated line of the service, it shall then be positively located by careful hand digging under the paved surface.

If the service has not been located, where possible the CAT shall be used as a guide in or down the side of the excavation

Remember the minimum distance for any power tools used in excavation work must be no closer than 0.5 meters either side of the indicated line of the buried service. This may be reduced:

i) where congestion of buried services renders it impracticable;

ii) where surface obstructions limit the space available,

but only if the line of the service has been positively identified by plans and confirmed by a locator.

5.7 Excavations With a Face More Than 1.5 Meters High

Where any face of any excavation is more than 1.5 meters high, that face shall be shored unless:

- the face is cut back to a safe slope and the material in the face will remain stable under all reasonably foreseeable conditions of work and weather

- the provision of shoring is impracticable or unreasonable, and safety precautions certified by an appropriately qualified person to be adequate, have been taken.

5.8 Safe Slopes in Excavation

The safe slope of an excavation shall not exceed:

i) IV:1H or the angle of repose, whichever is flatter, for soils above the ground water table.

ii) IV:1.5H or the angle of repose, whichever is flatter, for saturated a submerged soils, or for excavations greater than 3m in depth.

iii) Where the slope of an excavation is benched, the maximum height between benches shall not exceed 1.5m, except for the bench adjacent to the work area which shall not exceed 1m. Overall, the total width of the benched excavation shall not be less than that required in (i) or (ii) above.

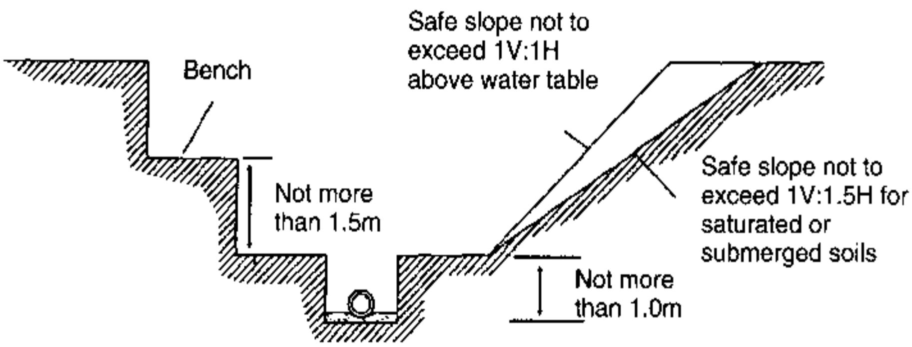


Figure 18.3: Excavation Face Benched and Battered to a Safe Slope

5.9 Materials and Loads Above Excavations

Excavated or other loose material shall be effectively stored or retained not closer than 600mm from the edge of the face unless the face is specially shored to allow for the increased load, and suitable toe boards or other safeguards are provided.

Mechanical plant, vehicles or any heavy loads shall not approach closer than:

- 600mm from the edge of an excavation which is battered to a safe slope
- what would be the edge of the face if battered to a safe slope unless the actual face is specially shored to allow for the full effect of the additional load.

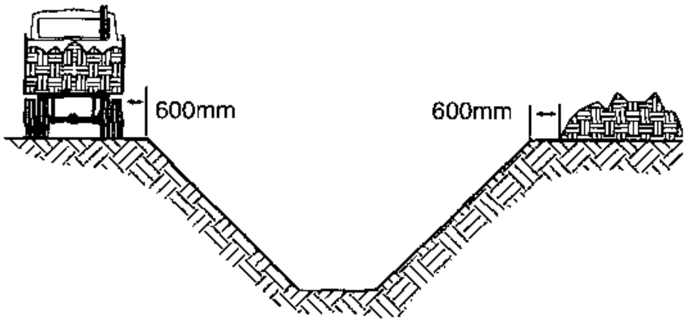


Figure 18.4: Excavation with Battered Faces

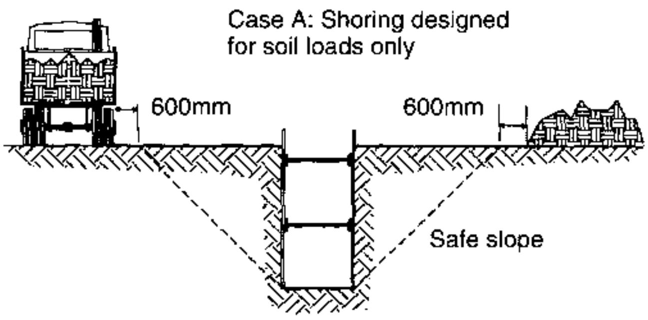


Figure 18.5: Excavation with Shored Faces.

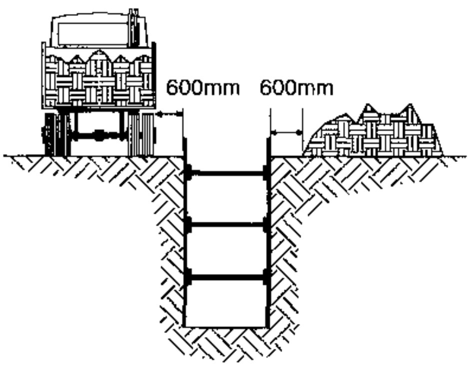


Figure 18.6: Excavation with Shoring Designed for Surcharge Loads.

5.10 Excavations Adjacent to Buildings or Structures:

Where it is intended to excavate alongside another structure, the precautions listed below shall be observed:

- Never excavate below the level of the foundation of any adjacent structure, or within an area which would be inside the safe slope, unless adequate precautions have been taken to ensure that the stability of the excavation face and the building or structures above are not at risk either during or after excavating.
- If an excavation is likely to affect the stability of existing structures, advice from an appropriately qualified person must be obtained before the excavation is started.
- Where pumping is being carried out to lower the ground water level, subsidence of adjacent structures may result. The characteristics of the supporting soil may be changed by pumping, causing a loss of fines and reducing the load-bearing capacity of the soil. If such works are to be undertaken, expert advice should be obtained.

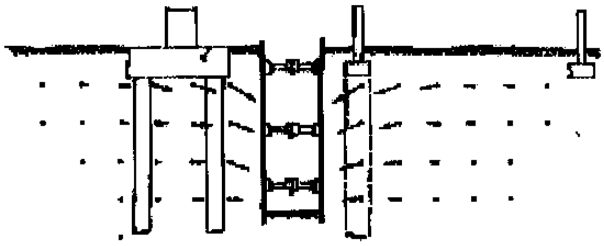


Figure 18.7: Building Foundations Adjacent to Trench

6. PARTIES WITH ACCESS AFFECTED

The Excavation Supervisor shall advise occupiers on work areas who may have their access affected by the contract works, when and where disruptions are likely to occur.

The Excavation Supervisor will advise SUPREME ENERGY that notice has been given.

7. EQUIPMENT

Equipment to be used in excavation shall be:

- specifically designed and manufactured for the purpose
- cleaned and maintained during use to ensure that performance is effective.

8. BARRIERS AND SIGNS

- Where construction vehicles or plant use public thoroughfares, notices shall be placed at all exits and entrances to the work area to warn of the excavation.
- For all work carried out on roads, temporary warning signs shall be erected and traffic control measures used (a person with a stop/go sign).
- Fencing used for protection shall be adequate to prevent ready access to it by any person.

- Excavations carried out at any workplace to which people have, or might gain access, must be guarded to avoid danger to people. A fence one meter high or a combination of signs, barriers, lights, markers, flags, or sentries may be necessary to provide adequate protection for the people and employees. These safety devices must be properly maintained until the excavation is complete or until there is no longer any danger.
- If an excavation is likely to collect or retain water of such a depth as will constitute a hazard to children or persons in the vicinity, the excavation must be covered or fenced off whenever workers are not present.
- Where excavation work is in or near access ways, and hazards exist, barricades, overhead protection, enclosed walkways or other means of protection shall be provided for the people.
- Where walkways or bridges are used, these shall be designed in accordance with sound engineering practice. Guard rails and mid-rails must also be provided where there is a fall hazard.

9. PERMIT-TO-WORK

A permit-to-work is required for all excavations with a face more than 1.5 meters high. The permit-to-work (Master Work Permit) shall be obtained from SUPREME ENERGY. The Excavation Plan will be submitted along with the Master Work Permit application and in some instances will be the basis of the permit. The Master Work Permit shall be completed before the work commences and the following details should be included:

- nature and location of the work
- name, address and contact details of the employer
- intended date of commencement of the work
- estimated duration of the work
- precautions to be followed.

10.EXAMINATION OF EXCAVATIONS

Excavations, including shoring and underpinning, shall be examined by the Excavation Supervisor before work starts each day, and after rain or any occurrence that could affect the stability of an excavated face.

Shoring members shall be checked for tightness against each other and against the soil face. A daily record shall be kept of examinations made, conditions found and precautions and/or actions taken (Form 18.2).

11.ROAD SURFACE CONDITION

Work shall be carried out in a manner that protects the works and which permits the safe and convenient passage of traffic with minimum delays over the whole length of road affected by the excavation.

12.SURFACE WATER AND DRAINAGE

In all excavations, the safety of faces and fillings often depends on the effectiveness of the control of surface and ground water. To control surface water, cut-off drains constructed parallel and a safe distance back from the face, shall collect water and discharge it clear of the working area. Drains may also be necessary in the trench itself.

Subsurface drains, well pointing, or sump pumping should be installed to cut off, remove, or intercept ground water and channel it away from the site if this is a hazard.

Well pointing can lower the water table 4-6 meters and is most suitable in sands. The inflow from clay soils to well-pointing may be insufficient to be effective. During construction, checks should be made for inflow from springs or seepage. Any inflow should be collected in sumps and pumped clear of the excavation.

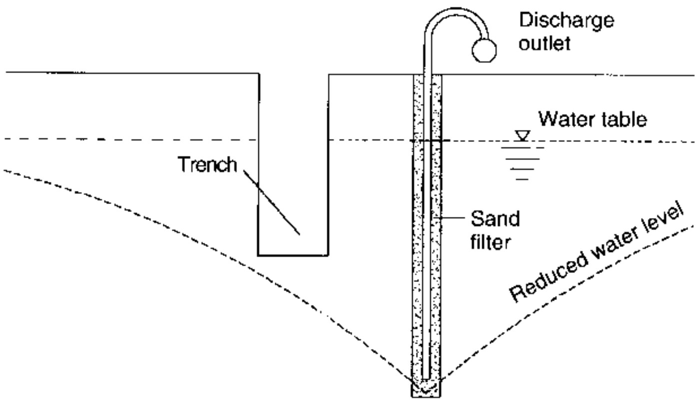


Figure 18.8: Well Pointing

Springs coming up through the floor of an excavation are another cause of unstable conditions.

13.HARMFUL GASES

Excavations being below ground are a natural receptacle for all gases heavier than air. Gas of various kinds, from quite unknown sources, can seep through the ground particularly where other work is taken place in the vicinity.

Typically specific gases are found for certain ground types. These are summarized in Table 18.1.

Table 18.1: Typical Gas for Specific Ground Types

Type of Ground	Gases or Fumes Found
Peaty ground	methane, hydrogen sulphide
Filled and made ground	carbon dioxide, hydrogen sulphide
Reclaimed land and tip fills	carbon dioxide, methane
Thermal areas	carbon dioxide, carbon monoxide, hydrogen sulphide, sulphur dioxide, methane
Petroleum installations, service stations	petrol fumes, LPG, kerosene
City streets	natural gas, carbon dioxide, steam

Where there is any likelihood of air contamination, the works must be examined, using the correct type of detecting equipment.

14.OVERHEAD SERVICE LINES

When using excavators, e.g. backhoe, consideration shall be given to overhead services in the vicinity of the work. No part of any plant, equipment or its load shall come within the minimum approach distances (set out below) from the overhead service lines unless written permission has been obtained from the owner of the lines.

Table 18.2: Minimum Approach Distances

Type	Minimum Distance in meters
Telecommunications	4.0
Line voltage not exceeding 66kV	5.0
Line voltage exceeding 66kV	6.0

15.PROTECTION AND SUPPORT SYSTEMS

Diagrams that show protection and support systems that are used to shore up trenches are presented below.

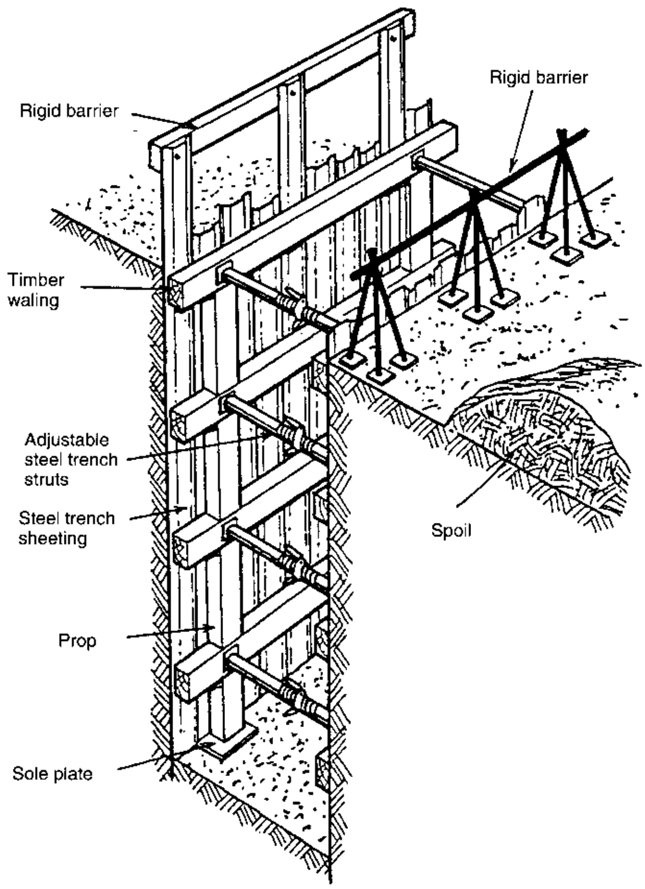


Figure 18.9: Typical Close Sheet Trench Support Method.

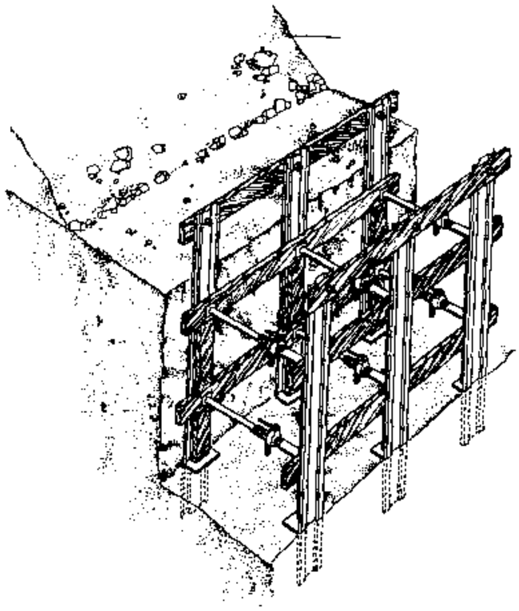


Figure 18.10: Quarter - Sheeting

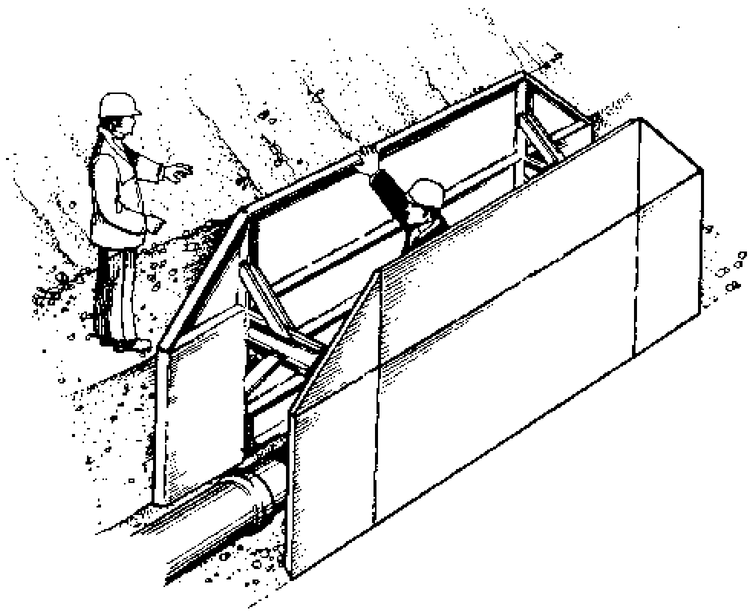


Figure 18.11: Trench Shield System

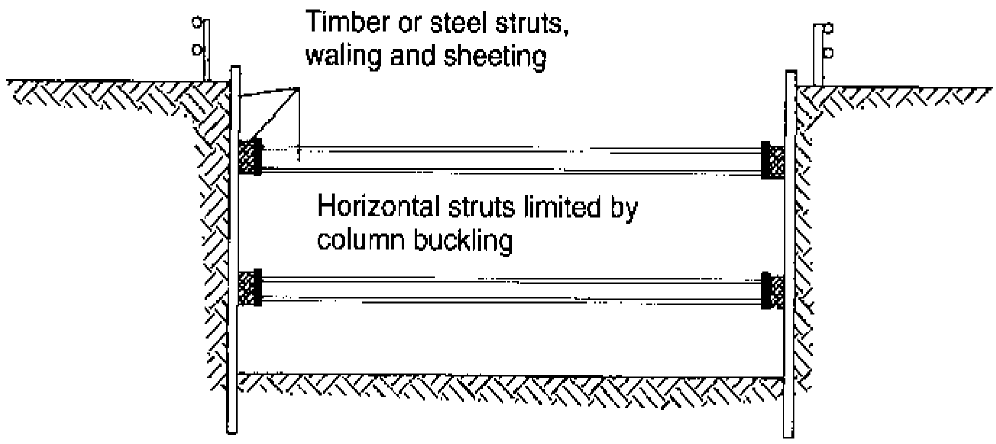


Figure 18.12: Horizontal Struts and Walings.

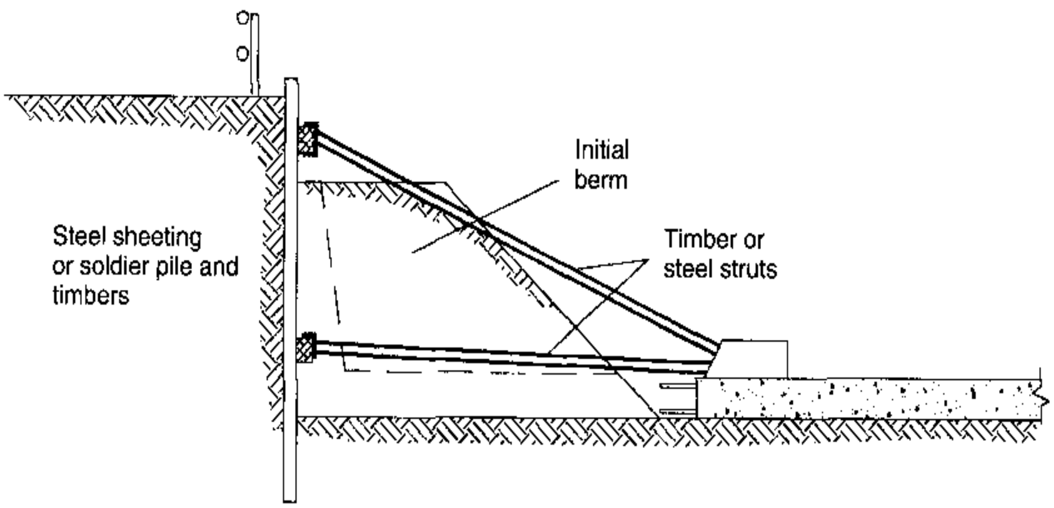


Figure 18.13: Raking Struts.

16.SHORING REQUIREMENTS FOR TRENCH EXCAVATIONS

The size and type of shoring required for trench excavations are specified in the following tables.

Table 18.3 : Timber Sheeting

Soil Conditions	Trench Depth (m)	Timber Sheeting	
		Min Dims (mm)	Horizontal Spacing (mm)
TYPE A			
Unsaturated ground; soils above ground water table or level	up to 3.0	150 x 50	1200 - 300 (a)
	3.0 - 4.5	150 x 50	600 - close (b)
	4.5 - 6.0	200 x 50	300 close (c)
TYPE B			
Saturated ground,	up to 3.0	150 x 50	close
soils with ground	3.0 - 4.5	200 x 50	close
water table or level			

Table 18.4 : Timber Waling

Soil Conditions	Trench Depth (m)	Timber Waling	
		Min Dims (mm)	Vertical Spacing C to C (mm)
TYPE A			
unsaturated ground;	up to 3.0	150 x 100	1200
soils above ground	3.0 - 4.5	150 x 100	1200
water table or level	4.5 - 6.0	250 x 100	1200
	Dims		Spacing C to C
TYPE B			
saturated ground,	up to 3.0	225 x 150	1200
soils with ground	3.0 - 4.5	250 x 150	1200
water table or level			

Table 18.5: Timber Struts

Soil Conditions	**Trench**	**Timber Struts (mm)**(1)				
	Depth	Trench width up to			Spacing C to C	
Horizontal	(m)	1.0	2.0	2.5	Vertical	
(mm)		(m)	(m)	(m)	(mm)	(mm)
TYPE A						
unsaturated ground;	up to 3.0	100 x 100	150 x 100	150 x 150	1200	1800
soils above ground	3.0 - 4.5	150 x 100	150 x 150	150 x 150	1200	1800
water table or level	4.5 - 6.0	150 x 100	150 x 150	150 x 150	1200	1800
TYPE B						
saturated ground,	up to 3.0	150 x 100	150 x 150	150 x 150	1200	1800
soils with ground water table or level	3.0-4.5	150 x 150	200 x 150	200 x 150	1200	1800

Table 18.6: Steel Trench Struts

Soil Conditions	**Trench**	**Steel Trench Struts (mm)**(2)				
	Depth	Trench width up to			Spacing C to C	
Horizontal	(m)	1.0	2.0	2.5	Vertical	
(mm)		(m)	(m)	(m)	(mm)	(mm)
TYPE A						
unsaturated ground;	up to 3.0	No.2	No.3	No.3	1200	1600
soils above ground	3.0 - 4.5	No.2	No.3	No.3	1200	1600
water table or level	4.5 - 6.0	2/No.2	2/No.3	2/No.3	1200	1600
TYPE B						
saturated ground,	up to 3.0	2/No.2	2/No.3	2/No.3	1200	1600
soils with ground water table or level	3.0-4.5	2/No.2	2/No.3	2/No.3	1200	1600

NOTES

1. All timber used for shoring shall be of sound quality No.1 framing grade or better.
2. Steel trench struts shall conform to BS 4074 : 1982 (Specification for Metal Pipes and Struts) or an equivalent standard. Metal props such as Acrow, Rapid Metal, etc. should not be used in place of trench struts.

3. Timber waling and sheeting made of steel or other material may be used in lieu of timber provided they are equivalent in strength to the sizes prescribed.

Appendix 1: Form 18.1: Excavation Plan

To: ....

Master Work Permit No: ……..

Contract Name: ....

From: …………...

Location of works: ....

Check list

(Please Tick appropriate Box)

Layout and detailed drawings.	☐	Traffic diversions.	☐
Hard surfaces/obstructions broken out.	☐	Existing services.	☐
Limitations on plant.	☐	Possibility of flooding.	☐
Presence of standing or running water.	☐	Means of draining water.	☐
Condition and stability of adjacent structures.	☐	Surcharge loads.	☐
Vibrations.	☐	Room for spoil and materials.	☐
Availability of water supply for jetting etc.	☐	Previous excavation.	☐
Evidence of hazardous contamination.	☐	Water table(s).	☐
Estimate of 'free-standing' time of ground.	☐	Ground to crack on drying.	☐
Pattern of discontinuities in rock.	☐	Special excavation techniques.	☐
Suitability of spoil for backfill.	☐	Profiles of ground depth.	☐
Full description of soils.	☐	Evidence of slope instability.	☐
Access to site.	☐	Notifiable to Client.	☐
Shoring type.	☐	Public Protection.	☐
ladders required.	☐	Gases Present.	☐
Work site condition.	☐	Controls of plant.	☐
Visibility adequate.	☐	P.P.E required.	☐
Site fenced, Etc.	☐	Emergency Procedures.	☐
Day or Night Operation.	☐	Hazard Identification.	☐

Name of Excavation Supervisor: ....……………………...

Contact Number: ....………………

Form 18.1 Excavation Plan (Cont.)

The proposed Excavation Plan is to show all relevant proposed shoring, use of fencing, cones and safety zones/clearances. In addition the plan must show any other aspects that may have impact on the safety of the services, road users or site personnel.

Prepared by: Name: .... Date: ....

(print)

Sighted by: Name: .... Date: ....

(print)

Appendix 2: Form 18.2 Excavation Inspection Checklist

This is a basic inspection sheet. Other items should be added as appropriate to a particular project.

Name: .... Contact Number: ....
Date: .... A. M. .... P. M. ....

Item required	**Checked**	**Action**
Is surface clear of plant, spoil heaps, materials	☐	....
Are spoil heaps being properly controlled	☐	....
Is the space between the trench arid spoil heap clear.	☐	....
Is the work properly fenced off and 'signed'.	☐	....
Is access adequate.	☐	....
Are ladders available and being used.	☐	....
Climbing on the timbering addressed.	☐	....
Is the trench safe from exhaust gases.	☐	....
Buried services clearly marked and protected	☐	....
Underground Services supported	☐	....
Is there any movement or deterioration of the ground.	☐	....
Is the area affected by any heavy vibrations.	☐	....
Is the pumping arrangements suitable.	☐	....
Is the work being done in accordance with Plan.	☐	....
Are materials used the correct design sizes and quality	☐	....
Are all struts horizontal and positioned squarely.	☐	....
Is the method for backfill a safe one.	☐	....
Is work tidy.	☐	....
Adequate lighting provided.	☐	....
Is PPE available and being worn by workers	☐	....
Others.	☐	....
Others.	☐	....

Comments:

....
....
....
....
....
....
....

supreme energy	SAFETY, HEALTH & ENVIRONMENT INCIDENT REPORTING & INVESTIGATION	PROCEDURE
CORPORATE	**INCIDENT / ACCIDENT REPORTING & INVESTIGATION**	SE-MSHE-IRI-PRO-0002 Revision: 0

APPROVAL

	POSITION	NAME	SIGNATURE	DATE
Prepared by	SHE Engineer	Erwin Patrisa Floris		
Reviewed By	Sr. SHE Manager	M. Arief Tarunaprawira		**23/10/12**
Approved By	VP Relations & SHE	Priyandaru Effendi		**24/10/12**

REVISION HISTORY

REV	DATE	BY	REVIEWED	APPROVED	DESCRIPTION
0					For Use

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1 INTRODUCTION

This section sets out the policy and practices for notifying, and reporting investigating on incidents/accidents that occur at SUPREME ENERGY facilities (workplace) in which SUPREME ENERGY personnel, contractor personnel, visitors, the public and SUPREME ENERGY property are involved.

SUPREME ENERGY policy requires all personnel, contractors and visitors to report any incidents that occur, including fire, explosion, natural disaster, equipment failure, plant, vehicle or other accident, other incidents or near misses. When an incident is reported, the practices stated in this section shall be followed.

2 DEFINITIONS

Incident
An unplanned event, of either minor or significant consequence, that may or may not result in an injury, illness, property loss or environmental impact. In this procedure the term “incident” refers to an injury or occupational illness; motor vehicle accident; fire or explosion; environmental release to soil, water, or air; property loss; or near miss.

Lost-Time Accident (LTA)
Any incident/accident that results in serious harm to an individual with that person either being hospitalised or not being able to return to normal duties within a period of 24 hours after the incident/accident, or where the incident results in severe damage to equipment.

Occupational Injury or Illness
Any death, injury or illness suffered by personnel which results from work activity or exposure in the work environment. Examples of injuries are fractures, cuts, burns, snake-bites, one-time over-exposure to chemicals, etc. Examples of illnesses are dermatitis, hearing loss, cumulative poisoning or a cumulative trauma disorder.

Recordable Injury (Medical)
A Recordable Injury is one which results in loss of consciousness, restriction of work or motion, transfer to another job or medical treatment (other than FA). Any case which involves lost workdays beyond the day of the incident (lost time or restricted duty) is recordable.

Recordable Illness
A Recordable Illness is any abnormal condition or disorder, other than one resulting from an occupational injury that is caused by exposure to environmental factors associated with employment. Illness includes diseases or rashes which may be caused by inhalation, absorption, ingestion or direct contact. Any properly diagnosed occupational illness is recordable, regardless of whether or not the case involves lost workdays or medical treatment.

Exceptions:

- The following illnesses are NOT recordable:
- Common cold or flu
- Mental illness

- Illnesses that surface at work, but result solely from a non-work related event or exposure that occurs outside the work environment.

First Aid (FA) Case
FA treatment is limited to one-time treatment and subsequent observation of minor scratches, cuts, burns, splinters, etc., which do not ordinarily require medical care or treatment is provided by a physician or a registered professional person.

Near Miss
An unplanned event in which there is no injury to personnel, minor damage to equipment or property, and no interruption to production, but which possesses the potential to cause an LTA or Recordable Injuries or FA or near miss.

Property Damage
Damage to equipment, plant or property resulting from an incident/accident. The level of property damage will define it as either Lost-Time Accident (LTA), Occupational Injury or Illness, Recordable Injury, Recordable Illness, FA, or near miss (see definitions above).

3 RESPONSIBILITIES

3.1 PERSONNEL

Personnel are responsible for the following:

- Immediately report all injuries or suspected injuries to their Supervisor. In cases where the personnel thinks medical attention is unnecessary at the time, he/she should report the injury/illness no later than the end of the shift. Seemingly insignificant injuries can require medical attention at a later date.
- Keep all medical appointments and follow the instructions of the treating physician.
- Keep their Supervisor advised of their work status and subsequent doctor appointments.

3.2 SUPERVISORS

Supervisors must give immediate attention to a personnel who sustains an occupational injury or illness. Supervisors are responsible for the following:

- Ensure the personnel receive prompt medical attention and follow-up care as necessary. Depending on the disposition of the case, ensure transportation to quarters or back to work is arranged.
- Go to the clinic (if warranted and practical) or stay in contact with the clinic to keep abreast of the personnel's condition and the disposition of

the case (hospitalized, held at the clinic, sent to quarters or returned to work).

- Immediately advise the Department Manager and SHE Manager if the injury is serious.
- Notify the injured personnel's family in cases of serious injury if he/she is unable to do so.
- Conduct an immediate on-scene investigation into the root cause(s) of the injury/illness and report the findings via memo and/or the appropriate report form to the Department Manager by the end of the following day.
- Take and document corrective action to prevent recurrence.

3.3 PARAMEDIC

Attend to the injured person's needs. Record at a later date the extent of the injuries and the treatment administered. Record accident in the Site Accident Register. Complete Government Agency (EBTKE bentuk IIIi) injury notification form.

3.4 SITE SR. LEADER (MANAGER/SUPERINTENDENT)

Manager/Superintendent are responsible for the following:

- Approving incident reports and managing implementation of remedial action items specified on incident reports and ensure accident is investigated and recommendations implemented.
- Reporting potentially serious incidents to the General Manager- Operations and/or the Managing Director/President, as appropriate and obtaining guidance concerning necessary Company and external notification requirements.

3.5 HEALTH SAFETY AND ENVIRONMENTAL TEAM

- Review work injury/illnesses classification to ensure it is correct
- Review the root cause(s) identified and the corrective actions taken, to confirm that both appear to be sound
- Ensure the incident is documented in Company incident statistical data base and prepare the report to Government Agency (EBTKE)
- To receive contractor's incident notifications.

3.6 CONTRACTORS

Contractors are responsible to prepare and submit the report to Site Leader (Manager/Superintendent) all incidents, including near misses within one day of the incident that occur while working at the site. Contractors are responsible for investigating any incident and reporting the incident to the Site SHESHESHE Representatives. The report shall be completed within five (5) days of the incident.

4 PROCEDURAL STEPS IN THE EVENT OF AN INCIDENT

4.1 PROCEDURE IN EVENT OF AN INCIDENT

In the event of an incident or near miss, the steps listed below should be followed.

- At the time of the accident, a person should first ensure their own safety, and then ensure the safety of others.
- Assess the situation.
- Minimise the risk of further injury by shutting down plant and equipment, turning off the power supply, extinguishing fires (if this is possible without taking undue risks), etc.
- Give appropriate FA, or get the nearest trained first-aider to administer first-aid.
- Ring (call) for emergency services (Paramedic) or get someone else to; this can be attended to earlier depending on manpower availability.
- Secure the area and do not interfere in any way with the accident scene (unless this is necessary to save life, prevent injury, maintain essential services or to prevent further damage or property loss).
- Should a person receive injury that requires treatment, above that which can be provided by the equipment contained in a first-aid box or by a trained first-aider, the site's Paramedic must be immediately notified.
- Report the accident/incident/near-miss to the immediate supervisor.

4.2 HANDLING WORK INJURIES/ILLNESSES

Injured personnel should be driven to Medical for examination and treatment unless he/she is seriously injured, in which case he/she should be taken by ambulance to the Clinic.

<u>Serious Injuries</u>

- Make the personnel comfortable. Do not move him/her unless conditions are such that on-going exposure to the surrounding area may result in further injury (fire, release of toxic chemicals, etc.).
- Call Medical immediately to dispatch the ambulance or respond by helicopter to the injury site.
- Administer First-Aid treatment as feasible, and if trained to do so.

<u>Non-Serious Injuries</u>

Provide transportation for, the personnel to the clinic. The injured personnel should not take the bus or provide his/her own transportation.

<u>Lost Time Accident (LTA) Procedures</u>

This section applies to an personnel due to a NON-LIFE THREATENING injury or injury requiring offsite treatment:

- The injured personnel should be accompanied to the clinic by his/her supervisor, or someone designated by supervisor, for consultation with Doctors and discussion of the injured person's situation. The supervisor or designee will ensure that the personnel do not leave camp without proper authorization. The personnel's supervisor or designee should remain with the personnel while at the clinic until the personnel is either released to return to work, held for observation, or given time off for recovery.
- Medical will contact the personnel's supervisor or the supervisor's designee (or SHE, if neither are available) to discuss the personnel's condition relative to his job functions before prescribing time off from work. Supervisors will be responsible to advise their respective management.
- When appropriate, the injured person will be held overnight at the clinic (whenever possible) or will be sent home for the rest of the day only, and will report to the clinic the next day for a follow-up examination. Patient will then either be released to work or given time off.
- The Medical doctor (if available) and the injured personnel's supervisor or designee (or SHE, if neither are available) should be informed before any personnel is prescribed time off from work. The patient should not be released from the clinic until the supervisor or designee (or HSE) has communicated with the doctor about the patient's condition.
- If restricted duty is prescribed, management will have to decide if, for the benefit of a personnel's rehabilitation, there is a restricted duty job that can be done.

5 INCIDENT REPORTING/RECORDING

- All incidents, including near misses to personnel, plant and equipment damage, must be reported to the person's immediate supervisor or foreperson.
- The immediate supervisor will ensure the incident (LTA, Recordable Injuries, FA or near miss) is recorded in the site's Accident Register (see Form 31.1 at end of this section) and will complete the initial sections of the Preliminary Incident Investigation Report Form (see Form 31.2 at end of this section).
- The Accident Register is held at each site under the control of the Site Sr. Leader (Manager/Superintendent). The register is divided into five parts:

  i) Lost Time Accidents.
  ii) Recordable Injuries.
  iii) First Aid
  iv) Near Misses.
  v) Property Damage

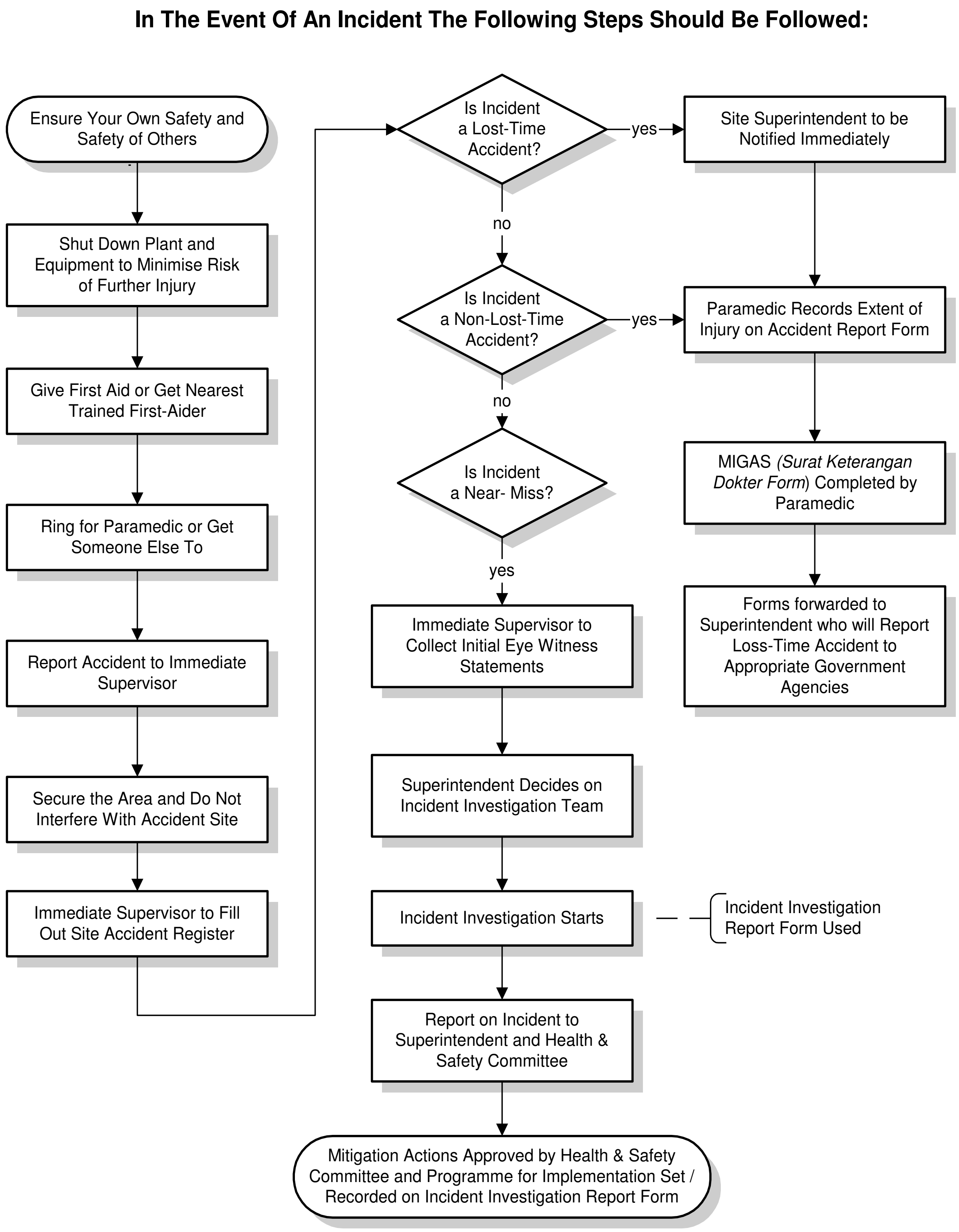
It records:
- the date and time of the incident
- briefly what happened
- personnel involved
- extent of injuries to personnel
- extent of damage to equipment.

- Once those personnel involved in the incident have received adequate medical treatment, or are recovered sufficiently to be questioned as to the cause(s) of the incident, then initial statements should be recorded by the immediate supervisor.
- Incidents/accidents reportable, or likely to be reportable to Government Agencies (ESDM), must be immediately brought to the attention of the Site Superintendent or deputy.
- The Paramedic shall record all details on the extent of the injuries received on the SUPREME ENERGY Paramedic Accident Injury Report Form (Form 31.3) on the Government Agency doctor report Form (Surat Keterangan Dokter) (Form 31.4). These completed forms shall be forwarded to the Sr. Site Leader (Manager/Superintendent) and a copy to the SHE Committee.
- For incidents that are reportable to Government agencies (ESDM), the scene of the accident shall be secured to allow it to remain in an undisturbed state until further notice, except where it constitutes a further safety hazard, then the supervisor in charge of the area must use their discretion in order to protect personnel and equipment.
- The Sr. Site Leader (Manager/Superintendent) will decide on who shall undertake the Incident Investigation, generally by work groups, the immediate supervisor and the Site SHE Representatives.
- The investigation shall be recorded on the Incident Investigation Report Form (Form 31.2) including all recommendations including improvements, work practice changes, disciplinary actions, etc.
- The Incident Investigation Report shall be forwarded to the Site Superintendent and to the SHE Committee for their review.
- The report shall be presented to the SHE Committee by the Site SHE Representatives.
- Report recommendations shall be reviewed by the committee and a programme to implement the recommendations developed. This programme will specify tasks, responsibilities and a timeframe for implementing the recommendations.
- The outcome of these discussions will be recorded in the minutes of the meeting and on the Incident Investigation Report.
- Progress as to implementing the recommendations will be tracked by the SHE Committee.

- Disciplinary action will be at the sole discretion of the Sr. Site Leader (Manager/Superintendent), in discussion with Corporate Human Resources Manager.
- Within 48-hours the Sr. Site Leader (Manager/Superintendent) will send to Government Agency (ESDM) details of the LTA on the appropriate forms. A copy will be sent to SUPREME ENERGY SHE Manager.
- A copy of the completed LTA investigation shall be forwarded to Government Agency (ESDM) and SUPREME ENERGY SHE Manager

The steps in the Incident/Accident Reporting are summarised in Figure 5.1

Figure 5.1: Incident / Accident Reporting



6 CONTRACTOR INCIDENT REPORTING

Contractors working under the jurisdiction of SUPREME ENERGY, in addition to their own incident reporting procedure shall:

- report the incident to the Site Superintendent
- ensure the incident is recorded in SUPREME ENERGY' Site Accident Register
- complete the Accident Report Form (31.3) if injury has occurred and the Incident Investigation Report Form (31.2).

The completed reports shall be forwarded to the Site SHE Committee.

7 ACCIDENT INVESTIGATION

7.1 ACCIDENT INVESTIGATION RESPONSIBILITIES

The aim of the investigation is to establish the cause of the incident, **not the guilty person,** and to determine whether or not the incident was caused by, or arose from, a significant hazard.

For every incident (LTA, Recordable Injuries, FA or near miss) reported, an incident investigation shall be undertaken and an Incident Investigation Report completed.

The incident investigation shall be carried out by the immediate supervisor in conjunction with the Site SHE Staff. They shall complete the Preliminary Incident Investigation Report (Form 31.2).

31.1.1 Points to Consider in the Investigation

Key points to include in the investigation are:

- Date and time of the occurrence
- People, materials, and equipment involved in the incident
- The location of the accident
- The general conditions that prevailed at the time of the incident;
  - the weather
  - road conditions
  - duties being conducted
  - lighting details
  - type of safety equipment being used
  - practices being followed, eg Permits-to-Work.
- Describe how the accident occurred; give minute to minute account of what happened.

- List actions taken and by whom, include all emergency details.
- Describe the severity of the injury and the likelihood of the accident happening again.
- Collect statements from witnesses clearly identifying the person making the statement.
- Establish underlying cause(s) of the accident and whether the accident arose from a ‘significant hazard’.
- Analyse and evaluate all non-trivial causes:
  - evaluate if the incident is traceable to an identified hazard
  - determine the critical and specific causes.
- Develop and take control measures that may reduce the risk of recurrence:
  - take temporary actions immediately;
  - take permanent actions as soon as possible;
  - consider alternative controls;
  - document all details through a written report.
- Review findings and recommendations:
  - have the report reviewed;
  - decide who should be notified.
- Follow-up:
  - monitor preventive and/or remedial actions;
  - add any new hazards identified to the Hazard Register.
- List remedial actions to prevent a recurrence of the incident recording all recommendations on the form.
- Take photographs and make sketches whenever practicable.

Remember the main tool of the incident investigation is the interview and it is important to ask the right questions.

31.1.2 Witness Statement

Usually a witness statement is taken, and may be produced in Court or at a legal hearing (whenever applicable). Persons involved in, or witnessing an accident, may be asked for a statement.

Statements must be both ‘relevant’, that is have direct relationship with the matter in hand, and ‘admissible’. There are certain rules that govern if evidence is admissible. Without going into too much detail, it is important to note that hearsay evidence is generally not admissible. That means that a person cannot report what they did not actually see, because the facts obtained are not their own, but gained through conversation with another person, e.g. Rudi said that he had been bitten by a dog, is hearsay as the author did not see a dog bite Rudi.

A statement should clearly identify who is making the statement, usually by providing the full name, occupation and address, and shall be signed and dated by both the person making the statement and a witness.

8 MEDICAL EMERGENCY PROCEDURES

The SUPREME ENERGY Medical Emergency Procedures shall be followed in the event of an unexpected serious illness or injury which needs hospital treatment.

9 DEATH OR SERIOUS INJURY NOTIFICATION PROCEDURES

Death is an unexpected event that may occur because of an accident or an illness. When this occurs, the Human Resource Procedures which cover the notification of nearest relatives, the transfer of the body to relatives, etc. will be followed. These procedures are beyond the requirement of this SHE Procedures which are to prevent injury and death, and to investigate those incidents which could result in death.

Reference should be made to the Personnel Manual as to relevant procedures for notifying relatives of a death or serious injury.

10 GOVERNMENT AGENCY (ESDM) ACCIDENT REPORTS

Government Agency (ESDM) forms that shall be used to report accidents and accident data to Government Agency (ESDM). Further detail will be inserted into this procedure that currently applied for Geothermal and Power Company.

11 APPENDIX

11.1 APPENDIX 1 : INCIDENT REGISTER

1. Particulars of Incident

____

____

____

LTA ☐	Recordable Injury ☐	First Aid (FA) ☐
Near Miss ☐	Property Damage ☐	

2. Location of Place of Work

____

____

3. Personal Data of Injured Person:

Name: ____

Residential Address: ____

____

____

Date of Birth: ______________________ Sex (M/F)______________________

4. Occupation or Job Title of Injured Person

____

5. Period of Employment by SUPREME ENERGY of Injured Person:

1st week ☐	1st month ☐	1-6 months ☐	6 months ☐
1-5 years ☐	over 5 years ☐	non-personnel ☐	

6. Treatment of Injury:

None ☐	First Aid Only ☐
Doctor but no hospitalisation ☐	Hospitalisation ☐

7. Time and Date of Incident

Time ______________________am/pm

Date ______________________________

8. Mechanism of Incident

Fall, trip or slip	☐	Hitting objects with part of body	☐
Sound or pressure	☐	Being hit by moving objects	☐
Biological factors	☐	Chemicals or other substances	☐
Mental stress	☐	Near miss	☐

9. Agent of Incident

Machinery or (mainly) fixed plant	☐
Mobile plant or transport	☐
Powered equipment, tool, or appliance	☐
Non-powered handtool, appliance or equipment	☐
Chemical or chemical product	☐
Material or substance	☐
Environmental exposure (e.g. dust, gas)	☐
Animal, human or biological agency (other than bacteria or virus)	☐

10. Body Part:

Head	☐	Neck	☐	Trunk	☐	Upper Limb	☐
Lower Limb	☐	Multiple locations	☐			Systemic internal organs	☐

11. Nature of Injury or Disease

Fracture of spine	☐	Puncture wound	☐
Other fracture	☐	Poisoning or toxic effects	☐
Dislocation	☐	Multiple injuries	☐
Sprain or strain	☐	Damage to artificial aid	☐
Head injury	☐	Disease, nervous system	☐
Internal injury of trunk	☐	Disease, musculosketal system	☐
Amputation, inc eye	☐	Disease, skin	☐
Open wound	☐	Disease, digestive system	☐
Superficial injury	☐	Disease, infectious or parasitic	☐
Bruising or crushing	☐	Disease, respiratory system	☐
Foreign body	☐	Disease, circulatory system	☐
Burns	☐	Tumour (malignant or benign)	☐
Nerves or spinal cord	☐	Mental disorder	☐

12. Where and How did the Incident Happen?
(If not enough room attach separate sheet(s))

____

____

13. Has an Investigation been Carried Out? Yes/No
Was a Significant Hazard Involved Yes/No
Employer or employer's representative (delete which is not applicable)

Signature and Date: ____

Name and Position: ____

11.2 APPENDIX 2 PRELIMINARY INCIDENT INVESTIGATION REPORT

1 SUPREME ENERGY SITE	2 DEPARTMENT		
3 EXACT LOCATION	4 DATE OF OCCURRENCE	5 TIME AM PM	6 DATE REPORTED

LOST-TIME ACCIDENT		NON-LOST-TIME ACCIDENT		NEAR MISS INCIDENT	
7 INJURED'S NAME		**13 INJURED'S NAME**		**19 PERSON REPORTING INCIDENT**	
8 OCCUPATION	9 PART OF BODY AFFECTED	14 OCCUPATION	15 PART OF BODY AFFECTED	20 OCCUPATION	21 COST (IF APPLICABLE) $
10 NATURE OF INJURY/ILLNESS		16 NATURE OF INJURY/ILLNESS		22 NATURE OF INCIDENT	
11 OBJECT/EQUIPMENT/SUBSTANCE/INFLICTING INJURY/ILLNESS		17 OBJECT/EQUIPMENT/SUBSTANCE/INFLICTING INJURY/ILLNESS		23 OBJECT/EQUIPMENT/SUBSTANCE/RELATED	
12 PERSON WITH MOST CONTROL OF ITEM 11		18 PERSON WITH MOST CONTROL OF ITEM 17		24 PERSON WITH MOST CONTROL OF ITEM 23	

25 DESCRIBE CLEARLY HOW THE INCIDENT OCCURRED (Continue on other sheets of paper as required)

26 WHAT ACTS, FAILURES TO ACT AND/OR CONDITIONS CONTRIBUTED MOST DIRECTLY TO THIS INCIDENT?

27 WHAT ARE THE BASIC OR FUNDAMENTAL REASONS FOR THE EXISTENCE OF THESE ACTS AND/OR CONDITIONS?

EVALUATION: 28 SEVERITY POTENTIAL	29 PROBABLE RECURRENCE RATE
MAJOR SERIOUS MINOR	**FREQUENCE OCCASIONAL RARE**

30 WHAT ACTION HAS BEEN, OR WILL BE, TAKEN TO PREVENT RECURRENCE? NUMBER ALL ITEMS IN SEQUENCE (Attach Additional Pages as Required)

31 CIRCLE NUMBER AND GIVE DATE OF INTERMEDIATE ACTION. CROSS OUT NUMBER (AND GIVE DATE) WHEN COMPLETED

INTERMEDIATE 1 __________ 2 __________ 3 __________ 4 __________ 5 __________ 6 __________ 7 __________ 8 __________

COMPLETED 1 __________ 2 __________ 3 __________ 4 __________ 5 __________ 6 __________ 7 __________ 8 __________

32 INVESTIGATED BY	33 DATE	34 REVIEWED BY	35 DATE

11.3 APPENDIX 3 PARAMEDIC ACCIDENT INJURY REPORT

To: SUPREME ENERGY
Attn:
From:
Subject: Medical Accident Report
Copy: SUPREME ENERGY Safety Department

Ref No.:

Name of Injured:____

Date of Birth ____

Company/Position:____

Date of Accident____

Time of Accident:____

Location of Accident: ____

Type of Injury:____

Cause of Injury:____

Treatment: ____

Recommendation:
1. Return to Work Yes/No
2. No of Rest Days ______
3. Further Treatment Yes/No

Report by: ____
Paramedic

11.4 APPENDIX 4 : FORM DOCTOR STATEMENT LETTER (TO GOVERNMENT)

"SURAT KETERANGAN DOKTER"

(Lampiran Bentuk IIIi)
TENAGA KERJA YANG MENDAPAT KECELAKAAN TAMBANG KARENA HUBUNGAN KERJA

Pada Instalasi: ....

Dokter yang harus melaporkan keadaan korban dalam 2 (dua) hari sesudah diperiksa

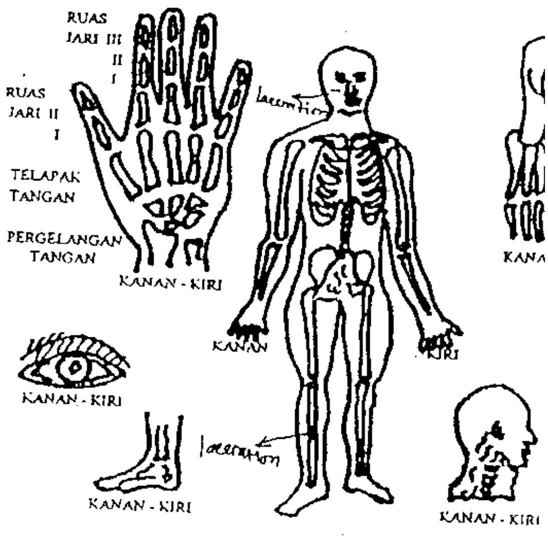
Nama Korban	:	**Umur**	: ....
Jabatan	:	**Tgl dan waktu Kecelakaan**	: ....
Alamat	:	**Tempat kecelakaan**	: ....

Keterangan tentang luka-lukanya.
Sebutkan bagian badan yang cedera dengan sifat lukanya. (Tunjukkan juga pada gambar).

....

....

....



Perawatan dan pengobatan .
Cara perawatan dan pengobatan yang diberikan.

....

....

Kehilangan hari kerja.
Akibat lukanya apakah yang bersangkutan dperlukan istirahat untuk dapat melaksanakan kembali pekerjaannya. (Sebutkan kira-kira berapa hari).

....

....

Uraian singkat terjadinya kecelakaan dengan sebab-sebabnya.
....
....
Keterangan lain-lain.
....
....

Tanggal pemeriksaaan	: .... 20 ....
Diperiksa oleh Dokter	: ....
Tanda tangan	: ....
Alamat	: ....

supremeenergy	SAFETY HEALTH AND ENVIRONMENT WORK RULES	PROCEDURE
CORPORATE	CONFINED SPACE ENTRY	SE-MSHE-WOR-PRO-0004 Revision: 0

APPROVAL

	POSITION	NAME	SIGNATURE	DATE
Prepared by	SHE Engineer	Erwin Patrisa Floris		
Reviewed By	Sr.SHE Manager	M. Arief Tarunaprawira		
Approved By	VP Relations & SHE	Priyandaru Effendi		17/05/2013

REVISION HISTORY

REV	DATE	BY	REVIEWED	APPROVED	DESCRIPTION
0					For Use

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1. INTRODUCTION

This section covers the precautions necessary for safely entering and working in confined spaces. It is the intention of SUPREME ENERGY to minimize the need for personnel to enter confined spaces through the use of careful job planning and good design.

This procedure does not apply to entering atmospheres Immediately Dangerous to Life and Health (IDLH), including asphyxiating atmospheres containing inert gases. Until proved otherwise, however, untested confined spaces should be considered as being IDLH. Entries involving IDLH atmospheres require local management's authorization to initiate special entry procedures.

Note that an atmosphere containing a gas concentration exceeding the recognized exposure limit is not automatically considered IDLH.

Related requirements and safe work practices for ensuring general occupational health and safety (for example, welding safety, safe use and care of respiratory protective equipment, and gas testing) are covered in more detail in other sections of this procedure.

1.1 Definitions

Attendant

An individual stationed outside a confined space, who monitors the authorized worker to enter a confined space and assists in maintaining their safety.

Confined Space

Any enclosed or partially enclosed space, either above or below ground, where there is some risk of reduced oxygen supply or accumulation of toxic, flammable or explosive materials, or where means of entry or exit are limited.

Confined spaces may include, but are not limited to:

- storage tanks, tank cars, process vessels, bio-filters, pressure vessels, silos and other tank like compartments
- open topped spaces such as pits, sumps, cellars or booths
- pipes, sewers, shaft and sumps
- cargo, ballast or void spaces of marine vessels.

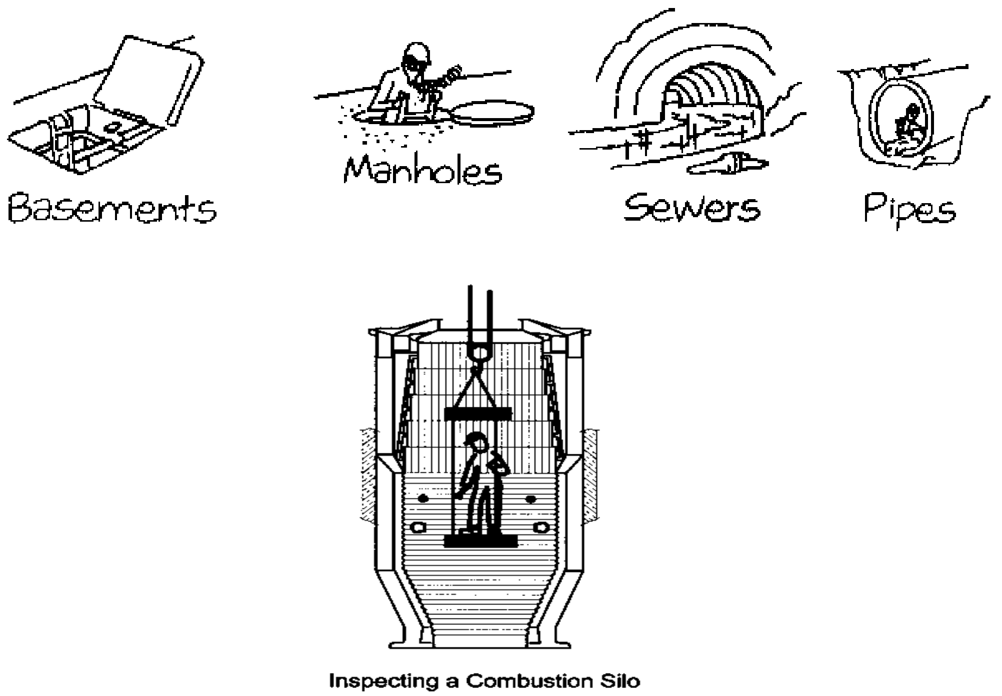


Figure 21.1: Examples of Confined Spaces

Recognized Exposure Limit (REL)

An exposure standard for chemical or physical hazards is defined as one that is:

- Adopted by a government agency with jurisdiction over the work operation
- Adopted by the Chevron Exposure Standards Committee
- Recommended by a consensus or scientific organization (such as the American Conference of Governmental Industrial Hygienists), based on sound scientific judgment

Entry

Entry into a confined space should be classified as either general or special.

<u>General Entry</u>

An entry should be considered general when testing establishes that:

- It contains neither significant hazards nor the risk of developing them.
- Ventilation is adequate.
- Oxygen levels are between 19.5 percent and 21.5 percent.
- Toxic materials (such as H2S, chlorine, ammonia, benzene) do not exceed RELs.
- Flammable gases or vapors do not exceed 10 percent of the lower explosive limit (LEL).
- Other air contaminants which may be present have warning properties (odor; taste; eye, nose, or throat irritation; etc.) below the REL.

<u>Special Entry</u>

An entry should be considered special when testing establishes that:

- A significant hazard exists or has the potential of developing but at levels below IDLH.

- Ventilation is insufficient to remove dangerous air contamination.
- Flammable gases or vapors are present or anticipated in excess of 10 percent of the Lower Explosive Level (LEL).

  Note: Entry is prohibited above 20 percent of the LEL.
- Oxygen deficiency (<19.5 percent) or enrichment (>21.5 percent) exists or may develop.

  Note: Entry is prohibited below 16 percent and above 21.5 percent.
- Toxic materials such as H2S, chlorine, benzene, carbon monoxide, ammonia are present or may become present in concentrations greater than the REL but less than the IDLH level.

Atmospheres

Hazardous

A hazardous atmosphere is one that may cause a person injury or illness due to the presence of one or more of the following:

- Flammable or combustible vapor
- Toxic substances in concentrations exceeding safe limits
- An oxygen deficiency or enrichment
- Ionizing radiation
- Heat
- Noise

Immediately Dangerous to Life or Health (IDLH)

IDLH is any condition that would

- Pose an immediate or a delayed threat to life
- Cause irreversibly adverse health effects
- Interfere with an individual's ability to escape the IDLH area unaided

Other Atmospheres

For guidelines about atmospheres not covered here, refer to the applicable material safety data sheet (MSDS); TLV booklet; or contact local HSE groups.

Flammability Range

Gives a measure of the proportion of flammable vapor to air and/or oxygen necessary for combustion (explosion) to be possible. The limits of flammability (or explosive) range is the range between the lower explosive limit (LEL) and upper explosive limit (UEL), (% by volume) in the form of an explosive/flammable mixture.

Gas Test Certificate

A signed statement by an authorized gas tester who is experienced and qualified in gas monitoring (toxic, flammable and oxygen) that tests have been undertaken within the confined space to be entered.

Isolation/Clearance

The process by which the confined space and systems within the confined space are removed from services, and completely protected against the inadvertent release of energy by placing them in a neutral mechanical/electrical state. (Refer to work control section of this procedure.)

Purging/Ventilation
The method by which contaminants are displaced from the confined space.

Safe Oxygen Level
A minimum oxygen content of 19.5% by volume and a maximum oxygen content of no greater than 21.5% by volume are the normally accepted limits. However these figures do not take account the effects of altitude. The lower limit for oxygen is set by physiological effects on the human body. It is the absolute oxygen level that is important and the true lower limit must be expressed as a partial pressure.

The accepted lower level of oxygen before alertness is affected is 183mbar. It can be seen from the table overleaf that altitude has a marked effect on the actual oxygen level if percentage (%) volume readings only are taken into account. To ensure a suitable margin for instrument inaccuracies, a minimum partial pressure of 195mbar shall be used where possible. Above 600m altitude, the minimum safe oxygen level in a confined space shall be deemed to be the normal ambient level reading taken in fresh air.

Table 21.1: Approximate effect of altitude on actual oxygen level

Approximate effect of altitude on partial pressure of oxygen (Read down column to find partial pressure of O_2 for a given percentage)							
Height (ft.)	Height (m)	Standard Atmospheric	Partial Pressure of Oxygen mbar				
		Pressure (mbar)	20.93% O_2 by vol.	20% O_2 by vol.	19.50% O_2 by vol.	19% O_2 by vol.
0	0	1013	212	203	198	192
1000	305	977	204	195	191	186
2000	610	942	197	188	184	179
3000	914	908	190	182	177	173
4000	1219	875	183	175	171	166
5000	1524	843	176	169	164	160
6000	1829	812	170	162	158	154
7000	2134	781	163	156	152	148
8000	2438	752	157	150	147	143
9000	2743	724	152	145	141	138
10000	3048	697	146	139	136	132

1.2 Responsibilities

1.2.1 General

Entry into a confined space is part of the SUPREME ENERGY' Permit-to-Work system and local management shall ensure that personnel entering confined spaces are trained in the entry permit practices stated in this system.

1.2.2 Entrants

Entrants shall

- complete the confined space training course and hold a current certificate of competency
- use personal protective equipment as directed by the Entry Permit
- verify that atmospheric tests have been conducted and the results are known
- enter the confined space only after ensuring all the precautions listed on the Entry Permit have been completed
- sign the Entry Permit to verify that requirements of the permit have been reviewed and followed
- alert the attendant and exit confined space whenever:

  - any warning sign or symptoms of exposure to a dangerous situation is recognized
  - a prohibited condition is noted.
- exit confined space if attendant orders an evacuation.

1.2.3 Attendants

The duties of the attendant(s) or standby person(s) outside the confined space are specifically related to those inside the enclosed space and include:

- checking person(s) into, and out of, the confined space
- being alert to all situations which may adversely affect those inside, including the danger of leaving the space unattended
- maintaining continuous contact (visually or verbally) with personnel inside
- summoning help if anyone inside gets into difficulties, e.g. via phone or radio communications
- being aware of possible behavioral effects of exposure to low oxygen or toxic chemicals
- ordering entrants to evacuate confined space if:
  - a condition is detected that the Entry Permit forbids
  - symptoms or behavioral effects of exposure are detected
  - a situation that could endanger the entrants is detected inside or outside the confined space.
- warning unauthorized person(s) to keep away from the confined space
- trained in first aid and cardiac pulmonary resuscitation.

1.2.4 Supervisors

For each entry, a supervisor requesting that work be carried out in a confined space should assure that personnel involved with the entry are trained adequately and competent in:

- Safe entry procedures
- Rescue methods
- Testing of space
- Safety requirements

Supervisors should assure that:

- all applicable, workplace, hazard evaluations have been identified on the permit and these hazards should include but are not limited to:
  - Oxygen
  - Toxic materials such as H_2S, carbon monoxide, ammonia
  - Physical agents such as heat, noise, ionizing radiation
  - Rotating equipment
  - Flammable gases and vapor tests
- All permits are issued properly and ensure entrants and attendant(s) read the Entry Permit and sign it
- post the approved Entry Permit in a conspicuous location near the entrance of the confined space. Use the Entry Permit to ensure necessary safety precautions have been taken.
- verify that the confined space and equipment within the confined space have been appropriately isolated and locked-out/tagged-out in accordance with the General Work Permit (see Section SE-MSHE-WOR-PRO-0013 Permit To Work System).
- atmospheric tests have been conducted and that the results meet the acceptable environmental standards
- verifying the required alarms, ventilation equipment, monitoring equipment, communications equipment, and rescue equipment are present and operational
- entry operations are consistent with the terms of the Entry Permit and that acceptable environmental conditions are present
- sign the Entry Permit, thereby affirming that all the safety measures listed on the Entry Permit have been taken and that they allow for safe entry into the confined space.
- All personnel involve are provided with proper protective and safety equipment as listed on the entry permit
- the standby person/attendant remains outside of the confined space at all times during the entry operations
- action taken to cancel the Entry Permit and terminate entry if acceptable environmental conditions are not present or if the conditions or work procedures described on the Entry Permit change.
- take the necessary measures to conclude the entry operation, such as closing off the confined space and cancelling the Entry Permit once the work inside the confined space has been completed.

1.3 Confined Space Hazards

Before entering confined spaces, the following particular hazards need to be considered and safeguarded against:

- oxygen deficiency/enrichment
- flammability, fire and explosion
- chemical hazards
- physical hazards
- other hazards such as noise or inert gases.

1.3.1 Oxygen Deficiency/Enrichment

Oxygen deficiency in the air results in loss of alertness, light headedness, degraded performance and asphyxiation. Typical causes of low oxygen levels are the presence of CO_2 or other gases replacing oxygen, or the use of oxygen by personnel working in a confined and poorly ventilated space. It is of note that persons suffering from lack of oxygen will not be aware of the onset of problems.

Other common causes of reduced oxygen levels are slow oxidation of metals (rusting), combustion, welding, and the displacement of oxygen by other gases (inerting with nitrogen or CO_2) and the use of inert gas welding with inadequate ventilation.

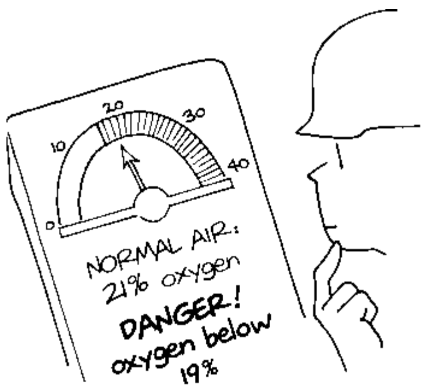


Figure 21.2: Oxygen Deficiency

Since the rate of combustion is closely dependent upon the concentration of oxygen present, an enriched oxygen atmosphere (greater than 21.5% by volume) becomes a hazard. (Note: at 22% O_2 spontaneous ignition can occur in some situations.)

There are four main causes which may result in oxygen enrichment:

i) Leaks from oxygen containing equipment
ii) Inadvertent use of oxygen instead of air or inert gas
iii) Deliberate addition of oxygen
iv) Oxygen generation from chemical reactions.

The most common oxygen containing equipment is that used in cutting operations. Storage cylinders, gas hoses, and valves must be handled with care and should be inspected daily for damage.

Gas cylinders must not be taken into confined spaces. Cutting and welding equipment must always be removed from confined spaces during breaks and at the end of the working day.

1.3.2 Flammability, Fire and Explosion

Fires and explosions can result from accumulations of flammable vapors and/or dust in the presence of a source of ignition.

Figure 21.3: Explosion or Fire Hazards

Mixtures of flammable vapors and air can be ignited only if the hydrocarbon to air ration is within flammable range, i.e. between the Lower Explosive Limit (LEL) and the Upper Explosive Limit (UEL). LEL and UEL are identical to the terms, Lower and Upper Flammable Limits (LFL, UFL) which are defined in section 21.2.

Explosive/flammable mixtures may develop typically during the emptying of vessels or tanks and the opening of confined spaces, due to air entering and mixing with the residual gases.

A source of ignition can be any heat source having enough energy to ignite the flammable gas/air mixture or to raise the temperature above the auto-ignition temperature. In addition to naked flames, other possible sources of ignition include:

- sparks or arcs produced by electrical equipment, lightning and electrostatic charges
- grinding sparks
- cigarettes
- hot surfaces raising the temperature above the auto-ignition temperature (e.g. hot pipes, hot exhausts)

- thermic reactions from aluminum, or other alloy tools striking against rusted iron or steel
- heat of friction during drilling or other non-flame cutting operation
- pyrophoric materials (e.g. iron sulphide)
- any other highly reactive material capable of producing sufficient heat for combustion (e.g. strong oxidizing substances such as hydrogen peroxide, or chemicals undergoing self-accelerating exothermic reactions when a critical temperature is reached, such as ethylene oxide).

Note: **On no account should a confined space be entered if the explosive meter reading is equal to or greater than 5% LEL (LFL).**
Hot work must not be undertaken if the explosive meter reading exceeds 1% LEL (LFL).

1.3.3 Chemical Hazards

Chemical substances can be toxic. These substances can cause injury, acute or long-latency illness, or death, depending on the concentration and duration of exposure and the characteristics of the substances.

Operations previously carried out in a confined space may have produced toxic gases or vapor which still remains. Some toxic gases are particularly dangerous because they cannot be detected by sight or smell.

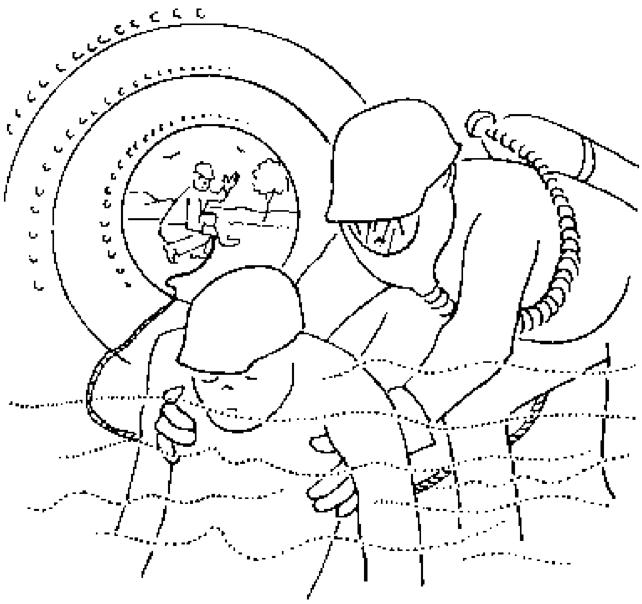


Figure 21.4: Toxic Gases or Vapors

A toxic substance can cause harm by inhalation, ingestion, skin or eye contact. It can affect the tissue at the point of contact, or organs elsewhere in the body. Corrosives destroy the tissue and may leave permanent injury or scars.

Toxicity information (e.g. Material Safety Data Sheets) about specific substances should be sought from the supplier of materials, and local and state regulatory bodies. They are to be made available on site.

The Occupational Exposure Standards (OES) referred to in this document are those published annually by the American Conference of Government Industrial Hygienists. Unless there are different national/local requirements, it is recommended that a level not greater than 50% of the relevant published occupational exposure standard is adopted as a safe limit. This additional safety margin is recommended because readings are based on regular spot sampling.

Typical toxic substances are carbon monoxide, hydrogen sulphide, hydrocarbon gases, sulfuric acid, ammonia, chlorine, biocides, caustic substances such as lye (sodium hydroxide), solvents and refrigerants

Contaminated personal protective equipment forms a hazard that should not be neglected.

1.3.4 Physical Hazards

Physical hazards may exist in confined spaces and include:

- structural failure, e.g. the internal floating cover or roof may not support a worker's weight
- falling tools and materials
- improper shoring, e.g. cave-ins may occur while personnel are working in trenches or excavated areas
- failure to positively isolate confined spaces, e.g. blank-off or break pipe connections
- failure to disconnect or make inoperative electrical or mechanical equipment
- migration of gases from adjacent places, e.g. sumps
- restricted working space and obstructions
- slippery surfaces
- inadequate lighting
- inadequate or faulty personal protective equipment
- noise levels in excess of site standards, e.g. hammering in confined spaces
- temperature extremes (high or low temperatures)
- sharp edges
- difficult access.

1.3.5 Other Hazards

These include:

- poor visibility, e.g. due to misty or dusty conditions

- persons being trapped in the event of an accident or loss of consciousness
- live electrical contacts (circuits) with the risk of electrocution
- high energy systems
- odors
- un-drained fluids
- unrelated medical conditions leading to incapacity.

1.4 Practices for Entry into a Confined Spaces

1.4.1 Entry Permit

Conditions necessary for safe work in or around a confined space will vary greatly depending on its location, configuration and use.

Entry into a confined space is controlled via the SUPREME ENERGY confined space entry permit (for more details, refer to SE-MSHE-WOR-PRO-0013 Permit To Work System). As part of this system a specific work permit must be completed which authorizes entry into the confined space and records that the necessary precautions have been actioned.

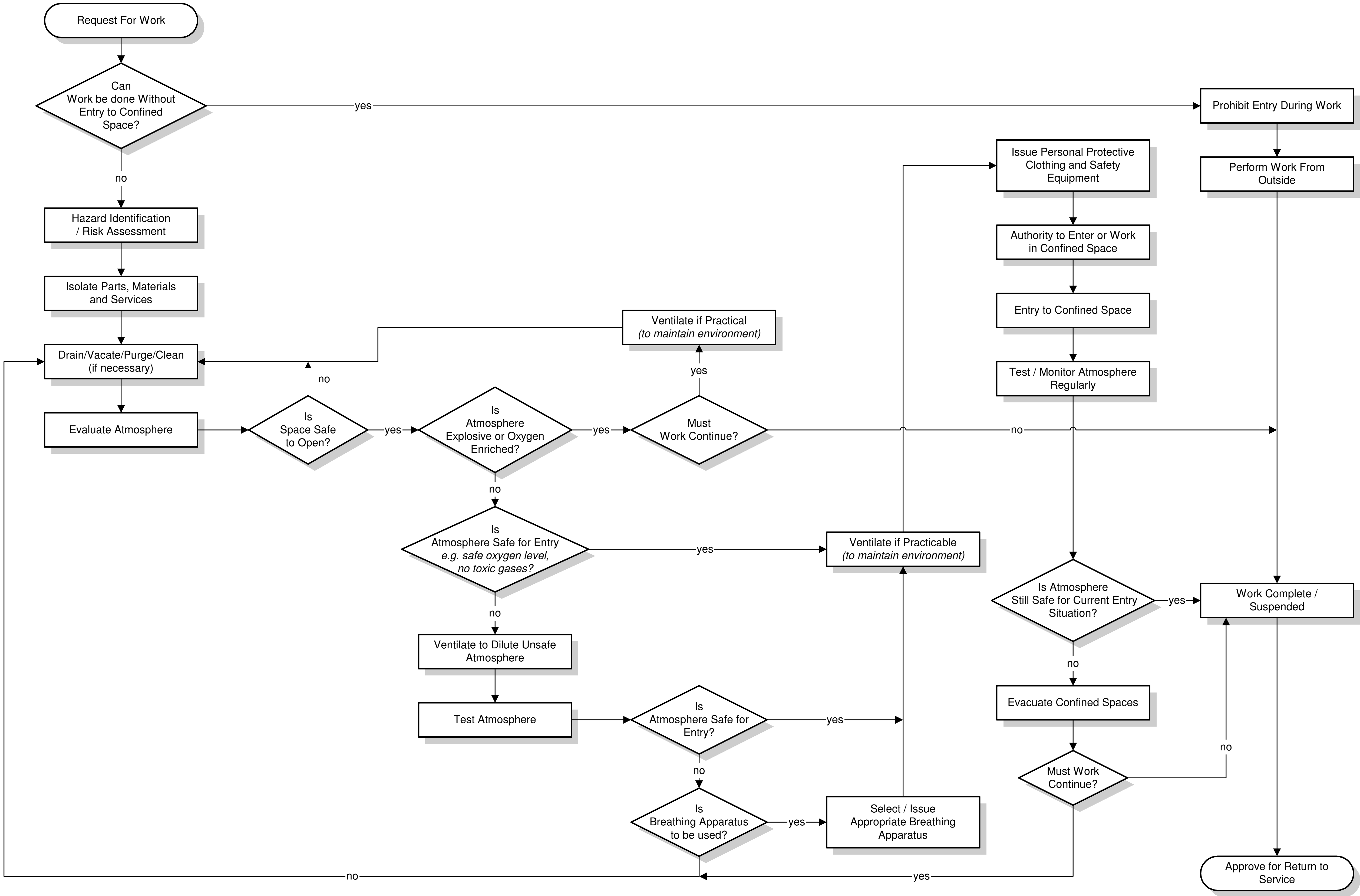
The entry permit:

- identifies the job and the associated hazards
- indicates the date and duration that the permit is valid
- links the entry to a specific General Work Permit (GWP)
- bears the appropriate signatures authorizing entry and showing that the safe work practices have been followed.

A copy of the completed entry permit shall be displayed in a prominent position outside the entry point to the confined space. The original will also be held with the GWP.

A flow chart showing the steps to be followed in filling out an entry permit is presented in Figure 21.5.

Figure 21.5: Confined Space Entry Process



1.4.2 Prerequisites for Entry

Prior to personnel entering the confined space the provisions listed below shall be met. (Refer also see 21.5.3)

- The Permit Applicant has verified that entry into the confined space is necessary. (See SE-MSHE-WOR-PRO-0013 Permit To Work System for definition of permit applicant).
- The potential hazards of the confined space and work to be performed in the confined space have been identified, assessed and recorded on the Entry Permit.
- All persons involved in the confined space entry (entrants, attendants, standby) are trained in these procedures, that training is verified, and they have been briefed.
- A Lock-out/Tag-out is in place as required by the General Work Permit. This should ensure that:
  - i.) the confined space is isolated from potential dangers by blinding, disconnecting and blanking or ties connected to the space; and
  - ii.) all electrical equipment in the confined space has been de-energized and locked/tagged out.
  - iii.) SUPREME ENERGY Lock-out/Tag-out practices shall be followed. Personnel shall confirm Lock-out /Tag-out is properly enforced.
- All ignition sources are removed if there are flammable or combustible materials in the vicinity of the work area.

1.4.3 Atmospheric Testing (Gas Test)

- The atmosphere both in and around the confined space must be tested before entry to determine if entry is permissible.
- Gas test results are to be entered on the Gas Test Certificate Form (See “Atmospheric Testing Certificate” Form - SE-MSHE-WOR-PRO-0013 : Permit To Work System) and posted at the entry point to the confined space (see Check List at 21.8).
- The initial tests for flammable gases, toxic gases, and oxygen deficiency should be made from outside the confined space, using a long probe or tube extension.
- Gas testing should be carried out only by authorized personnel who have been trained in the use of the equipment and who can interpret the results correctly.
- The confined space may be deficient in oxygen. Check the air with an oxygen meter. If oxygen concentration is outside the safe range **DO NOT ENTER UNDER ANY CIRCUMSTANCES** without wearing an external air-supplied respirator or self-contained breathing apparatus. (Canister-respirators must not be worn).
- If oxygen level is within the safe range it is permissible to enter but, the atmosphere should be continuously monitored while in the confined space.

- Before entering, also test that the confined space does not contain flammable vapors with a flammable gas or explosive meter. These vapors may not be picked up as a reduced oxygen level. Continuously monitor for flammable vapors while in the confined space if liquid residues are present.
- On no account should a confined space be entered if the explosive meter reading is equal to or greater than 5% LEL. Between a reading of 1% to 5% of LEL self-contained breathing apparatus (SCBA) will be required to be worn by those entering the confined space.
- Before entering the confined space, test for the presence of toxic gases (e.g. hydrogen sulphide) using personal detectors and/or continuous monitors.
- On no account should a confined space be entered when the level is within 50% of the Occupational Exposure Standard (TLV-TWA) for that containment without appropriate respiratory protective equipment being worn. (Refer to ACGIH publication on Threshold Limit Values and Biological Exposure Indices.)

Gas tests must be carried out in such a way that the result obtained is representative of the condition of the **entire** space paying particular attention to locations where toxic or flammable gases may accumulate e.g., sumps.

It is essential that all testing equipment used is:

- suitable for the test required
- of approved type, e.g. intrinsically safe
- correctly maintained and calibrated
- frequently checked against standard samples.

The results shall be recorded on the entry permit, but a separate written record must be kept of all test results.

Monitoring should be repeated at regular intervals as required by the entry permit while work is in progress and always after a work break, especially prior to re-entering the work area. The use of continuous monitoring equipment may be considered, but care should be taken in its positioning.

1.4.4 Ventilation

- If necessary, the confined space should be purged continuously or force ventilated for some period prior to entering. The Entry Supervisor shall verify by signing the entry permit that this task has been completed.
- Atmospheric tests should be repeated and the results recorded (after purging/ventilating).
- Ventilation of the space may be continuous in some situations.
- Never attempt to ‘sweeten’ air that is deficient in oxygen by introducing pure oxygen from a cylinder.

1.4.5 Safety Equipment

- A self-contained breathing apparatus escape set (ELSA) should be carried by each person entering the confined space.
- Each person entering the confined space should wear a safety harness. A lifeline shall be available by the entry point.
- Personal monitors for gas and/or flammability shall be worn by persons entering confined spaces.

NOTE: The Entry Supervisor is to ensure that all equipment to be taken into the confined space is suitable (electrical equipment connected to earth leakage breakers, etc.).

1.4.6 Prior to entry

- An observer (attendant) has been appointed and stationed outside the confined space.
- The attendant has verified that all communications equipment is present and operational.
- The attendant has verified that rescue equipment is present and operational.
- The Entry Supervisor has verified on the entry permit, that all required ventilation equipment, monitoring equipment, communication equipment and rescue equipment is present and operational.
- Personal protection equipment has been inspected by the entrants.
- The standby person has been instructed by the Entry Supervisor to remain outside the confined space at all times during entry operation.
- The calibration date on monitoring equipment has been checked and verified by the Gas Tester.
- The general work area is marked off with hazard tape or temporary barriers to prevent unauthorized access.
- The authorized entrants, attendants and Entry Supervisor have signed the Entry Permit to confirm that the requirements of the Entry Permit have been followed to allow for safe entry.
- The attendant is positioned outside the confined space and records the time and date of those authorized persons who enter and exit the confined space.
- The Entry Supervisor posts the Entry Permit in a conspicuous location close to the entrance of the confined space.

The Entry Supervisor is responsible for ensuring that all the requirements specified on the Entry Permit have been followed prior to entry.

If the conditions or work conditions described on the Master Permit-to-Work or Entry Permit change, the existing Entry Permit is no longer valid and a new Entry Permit shall be completed and approved.

1.4.7 Entry into Gas-Free Spaces

Immediately after the authorized entrant has entered the confined space, the following action shall be followed:

- Communications between the entrant and attendant are to be tested to confirm effectiveness, e.g. voice, radio, etc.
- Throughout the duration of the Entry Permit the requirements listed below should be met.
- Regular gas tests will be carried out to check atmosphere conditions at intervals specified on the Entry Permit.
- The gas test results will be recorded on the Entry Permit.
- Continuous ventilation of the confined space shall be monitored.
- Communications between the entrant and attendant shall be maintained to ensure the safety of entrant.

If any of the conditions specified on the Entry Permit changes or the nature of work in the confined space changes, the entrants must exit the confined space and a new Entry Permit completed and approved prior to re-entering.

1.4.8 Entry into Non-Gas Free Spaces

- When every effort has failed to gas-free the confined space as specified in Section 21.5.2, entry may still be permitted subject to very stringent precautions.
- Entry to a space with the following oxygen and explosive meter readings is permitted only with an appropriate self-contained or compressed air line-fed breathing apparatus:
  - oxygen content: out of safe range
  - explosive meter reading: greater than 1% but not more than 5% of LEL
  - toxic gas concentration exceeds 50% of TLV (H_2S, etc.).
- Details of the gas test(s) should be entered on the Entry Permit and Gas Test Certificate.
- Continuous gas testing is required while entrants are in the confined space to ensure there are not significant changes in atmospheric conditions.

- Persons must wear air-supplied breathing apparatus and a lifeline/guideline. Air-purifying respirators cannot be used.
- A suitable number of attendants must be on duty. Some of whom shall be fitted with the appropriate equipment (SCBA) and so be effectively prepared to undertake an immediate rescue if necessary.
- In certain circumstances, such as work inside spheres or tall columns, it may be necessary to use a safety harness in conjunction with a special winch or pulley, or additional manpower, to ensure prompt response in an emergency requiring the removal of person(s) from the confined space.
- The number of persons permitted to enter a confined space should be limited according to the available space, the number of escape routes and the rescue facilities.
- The Entry Permit will specify the precautions necessary for the entry, the subsequent work to be carried out, and knowledge of emergency procedures also the period of validity.

Note: Where there is a life threatening situation, or in case of extreme emergency, or to prevent the development of a potentially dangerous situation, it may be necessary to permit entry under less stringent conditions. In such circumstances special authorization is required and appropriate breathing apparatus must be worn.

1.4.9 Completion of Work

At completion of the work within the confined space, the actions listed below shall be performed.

- The attendant shall verify and record in their log that all entrants have exited the confined space.
- The entrants and Entry Supervisor shall restore or arrange to put the item of equipment back into service.
- The Entry Supervisor shall cancel the Entry Permit and forward the completed permits to the Senior Supervisor's office.

1.5 Training Requirements

1.5.1 SUPREME ENERGY

All SUPREME ENERGY employees and contractors involved with entry into, and working in, confined spaces shall be trained in confined space entry. A certificate stating the person(s) level of competency shall be issued on completion of the training and the training records noted.

Training shall familiarize authorized personnel with the following:

- types of confined space found at the site
- physical and chemical hazards involved and the signs and symptoms of exposure to the hazards
- the need for atmosphere testing and use of personal monitors
- atmosphere testing and monitoring of the confined space
- cleaning, purging and ventilation techniques
- isolation and lock-out/tag-out procedures
- personal protective equipment, in particular correct use of respiratory protective equipment
- responsibilities of attendant, entrant, Entry Supervisors, Senior Supervisor
- rescue and emergency response actions
- the Entry Permit requirements.

1.5.2 Contractors

SUPREME ENERGY shall ensure that all contractors involved with confined space entries shall have had confined space training within the last two years. In addition, these contractors shall have attended a SUPREME ENERGY specific work site induction course prior to commencing work at the site.

Contractors shall produce evidence proving their employees who have completed Confined Space Entry Training and the dates when training was completed.

1.5.3 Refresher Training

Refresher training for all personnel who may be required to enter confined spaces shall be completed every two years.

1.5.4 Training Records

Training records and competency levels shall be documented and submitted to the appropriate SUPREME ENERGY Human Resources Department.

1.6 Emergency and Rescue Action

The procedures listed below must be followed during an emergency and rescue action.

- On no account must the attendant(s) stationed at the entrance attempt to enter the space until additional help has arrived.
- No rescue must be attempted without wearing self-contained breathing apparatus and a harness. Whenever possible, a lifeline/guideline should be used.
- The restoration of the casualty's air supply at the earliest possible moment is of paramount importance. An ELSA may prove useful for the first few minutes whilst a proper breathing supply is prepared for use.

- The victim must be brought out with the least delay and then their physical injuries can be attended to.
- Every moment is vital but this should not induce the rescue team to take unnecessary risks.
- Unless the person is gravely injured, e.g. a broken back, any physical injury which has been sustained is of secondary importance to maintaining a safe air supply. The victim must be brought out with the least delay.
- To rescue personnel from an in-ground manhole, a man winch, fitted to a tripod will be required.
- If air is being supplied to the person(s) in the space through an air-line, a check that the supply of air is being maintained at the correct pressure must be made continuously by the attendant(s)
- Any attempt at rescuing a person who has collapsed within an enclosed space should be based on a rescue plan developed for the site, having regard to the site location and any peculiarities or special requirements of each individual space.
- If the rescue operation is a long one, the continued supply of fully charged air cylinders for the self-contained breathing apparatus of the rescue team and/or the provision of a continuous air supply to those at the scene of the accident from a reliable source of compressed air of breathing quality is an essential requirement.
- Drills must be held at regular intervals to prove the capability of the rescue team under different and difficult conditions. The need to allocate personnel to relieve or back-up those first in action must always be anticipated.
- Pre-planning is essential if any success at all is to be achieved since survival after loss of air supply is dependent on time. Restoring the victim's oxygen requirements is a first priority.

Every site and task will have its own special problems, each of which may require a different rescue procedure. Notwithstanding this, many procedures have common elements which are universally applicable as the following paragraphs illustrate.

- The successful rescue of any person(s) from an enclosed space is dependent on a pre-existing plan, trained personnel and good, well maintained equipment. All breathing apparatus, safety harnesses, lifelines and resuscitation equipment provided for use in, or in connection with, entry into confined spaces and particularly for use in emergencies **must be properly maintained**. This must be controlled by a planned maintenance system.
- All items of breathing apparatus should be periodically examined, and as soon as possible after every occasion on which the apparatus has been used.

1.7 Check List

To be completed/checked by the Entry Supervisor before starting work.

	Yes	No
Have all entrants/attendants received training for this task?		
Is (are) there the necessary work-permit(s)?		
Are you familiar with the company's procedures for entering confined spaces?		
Do you fully understand your specific responsibilities for this task?		
Are you and the work force wearing the appropriate personal protective clothing?		
Have you arranged for the appropriate fire protection and safety equipment?		
Are all connections to the confined space isolated/removed?		
Are all electrical/hydraulic connections in and outside the confined space locked-out and tagged (see MWP)?		
Are there radiation or other unusual hazards?		
Is the confined space gas free?		
Is the oxygen level satisfactory?		
Are there physical hazards in the confined space? If so, what has been done to minimize their effect?		
Is (are) the necessary attendant(s) for standby responsibility assigned?		
Is the work force (those who enter the space and attendant(s)) familiar with the necessary safety procedures?		
Is the work force physically and mentally fit?		
Have you tested that all breathing apparatus and other safety equipment is functioning properly?		
Have lifeline(s) or harness(es) been provided?		
Does the electrical equipment meet requirements?		
Is the attendant/standby person(s) aware of his/her duties regarding communication with and rescue from the confined space?		
Is access and egress adequate for persons entering or leaving the confined space?		
Will continuous monitoring take place during work to ensure confined space is gas free and has sufficient oxygen?		
Is there a contingency plan (rescue plan) available and are all relevant personnel familiar with it?		
Have precautions been taken to make unauthorized access impossible, especially when work is temporarily suspended?		
Do you know whom to refer to in case of uncertainty?		

To be checked jointly by the attendant(s) and persons to enter the space after relevant checks in the above have been made.

	Yes	No
Have you been trained in enclosed space entry procedures and the responsibilities of an attendant?		
Have you been given instructions or permission by the Supervisor, or person in charge, to enter the space?		
Are you satisfied all relevant checks in the above have been completed?		
Do you understand the arrangements made for communication?		
Are you aware that you should leave the space immediately in the event of ventilation or communication failure?		

Where breathing apparatus is to be used, this section must be checked jointly by the Supervisor and the persons who are to enter the space.

	Yes	No
Are you familiar with the apparatus to be used?		
Have you checked the communications equipment?		
Have you checked the apparatus as follows:		
i) Adequacy of air supply?		
ii) Low pressure audible alarm?		
iii) Face mask - air supply and tightness?		
iv) Availability of emergency air supply when working in inert atmosphere?		
v) Operating time limits calculated and checked?		
Have the emergency signals and other emergency arrangements been agreed?		

Person(s) entering the confined space should show their completed checklist to the attendant before entering.

supremeenergy	**SAFETY HEALTH AND ENVIRONMENT WORK RULES**	**PROCEDURE**
CORPORATE	**HOT WORK**	SE-MSHE-WOR-PRO-0005 Revision: 0

APPROVAL

	POSITION	NAME	SIGNATURE	DATE
Prepared by	SHE Engineer	Erwin Patrisa Floris		
Reviewed By	Sr. SHE Manager	M. Arief Tarunaprawira		
Approved By	VP. Relation & SHE	Priyandaru Effendi		**17/05/2013**

REVISION HISTORY

REV	DATE	BY	REVIEWED	APPROVED	DESCRIPTION
0					For Use

TABLE OF CONTENTS

1. INTRODUCTION

This section outlines 'hot work' safe work practices that will be followed at SUPREME ENERGY worksites. Hot work is any work that involves the generation of intense heat such as welding, grinding, and flame cutting, etc. that could cause ignition. Hot work can present a significant hazard if not planned and controlled.

In particular, this section covers SUPREME ENERGY' safety requirements for:

- electric arc welding
- gas welding and cutting
- hazardous hot work on tanks and drums.

Personnel performing hot work activity should obtain a hot work permit before starting any work involving a source of ignition. This permit should state in writing all appropriate precautions to be taken for the specific work, including:

- The type of equipment involved in the hot work
- The type of hot work to be performed (e.g., cutting, welding, grinding)
- The protective equipment required
- Special hazards relating to the hydrocarbon product, hot work location, or type of hot work to be performed, and measures taken to mitigate the hazards
- Standby fire-suppression equipment and fire watches required
- The expiration date and time of the hot work permit

2. TRAINING

Welding or gas cutting equipment shall not be used by personnel unless they are adequately trained and familiar with its safe use. Training is to include all safety related aspects as well as welding procedures. Welders must be qualified for the application. If being trained, then the trainee must be under strict, qualified supervision. A person should never operate equipment that they do not understand.

All printed rules and operating instructions supplied by the manufacturer of either the welding/grinding equipment or that being worked on or situated nearby are to be followed.

3. GENERAL

The work area must be kept free of flammable liquids or combustible material (such as oil, wood, paper, or piles of rubbish in which sparks could smolder and burst into flame. Any oil spillages should be cleaned up and the area 'sponged' or 'mopped' with sand or a proprietary cleaner.

Suitable and sufficient fire extinguishing equipment must always be stationed in the immediate vicinity of the work area. All workers should know how to operate the fire extinguishing equipment. Firewatchers must be appointed in locations where any fire risk exists.

Hot work should not be carried out while an automatic fire sprinkler system or drench system is out of action in the area that the work will be carried out, (refer to Section…: *Fire Prevention and Fire Fighting Equipment*) unless the system may be activated by the hot work itself.

Never use an empty drum, tank or container as a work platform or as a support for welding, cutting or grinding, etc. The torch flame or sparks may ignite vapors or solid residues inside it. Either use a proper support or clean the container as described in Subsection 20.11: *Hazardous Hot Work on Tanks and Drums*.

Physical protection, and chalked warnings, is to be used if there is any danger of other people touching or standing on work pieces that are, or may become, hot.

Care must be taken that heat, sparks and slag from welding or cutting operations do not damage existing or surrounding surfaces and equipment or injure people.

Before using any welding or cutting equipment, it must be checked that everything appears to be in good condition and in operating order. If this is not the case then the equipment must not be used until repaired (Refer also to Subsections 20.8: *Gas Welding and Cutting* and 20.9: *Electric Arc Welding* for specific checks that should be done prior to using welding/cutting equipment).

Special care must be taken when welding pesticide spray equipment as many insecticides decompose and produce the toxic phosgene gas when heated.

4. FIREWATCHERS

Firewatchers are required whenever any fire hazard exists, and whenever the 'hot work permit' states that one is required. It is the responsibility of the 'person in charge' that the firewatcher understands the dangers of hot work, the hazards involved with the work to be undertaken, the duties of the firewatcher, and how to use the appropriate firefighting equipment.

Deciding the requisite number of firewatchers required on the installation for a job is the responsibility of the 'person in charge' in conjunction with the supervisor who authorizes the hot work permit. The decision should be based upon what is reasonably practical while ensuring safety, as well as the time period involved.

The sole duty of the firewatcher(s) during the work shall be to act as firewatcher. The duties of a firewatcher shall never be combined with that of a welders mate.

4.1.1 Firewatcher Training

Firewatcher assigned to fire-watch duties should be given initial basic training on the general aspects of fire prevention and first aid firefighting. Further training should include the following:

- types of portable fire equipment available
- general procedures and permit-to-work systems applicable to hot work operations
- Firewatchers' duties.

4.1.2 Fire-watch Duties

The duties of the assigned firewatchers include the following:

- checking all hot work area for possible ignition sources and/or presence of combustible materials prior to, during and after, hot work operations,
- ensuring that suitable portable fire extinguishers, fire hose reels, fire blankets, etc. are located and readily available for emergency use at all hot work sites. A fire extinguisher is to be at immediate hand.
- maintaining a constant watch during actual hot work operations for possible sparks, hot slag, or hot spots etc. which could cause fire. This duty may require inspection of both sides of walls, under floors, and in roof spaces.
- initiating emergency action in the event of the start of a fire. This includes immediately warning the welder and nearby workers, and attempt to extinguish it while it is still small. If the fire is not quickly put out the firewatcher is to ensure that the site alarm is activated.
- re-checking the area after completion of hot work to ensure that all work surfaces have been cooled to normal temperature and that no hot slag, smoldering debris or any other ignition source remains and then if necessary, thoroughly wetting down the area and all areas in which a spark may have penetrated. Re-inspection of an area may have to be continued regularly for an extended time. In the case of controlled cool-down of the work place this period may run into many hours.

5. VENTILATION

The work area should always be well ventilated when welding. Ultraviolet light from welding changes oxygen in the air to ozone that irritates the lungs. There are toxic substances in fluxes, filler rods, coatings and cleaning agents. Other poisonous fumes are produced by welding, cutting or grinding metal coated with paint, resin or varnish. Carbon monoxide is also produced; it is odorless and leads to unconsciousness and even death at concentrations of greater than 50ppm.

6. ELEVATED WELDING

*(*Refer also to Section SE-MSHE-WOR-PRO-0030 *Working at Height.)*

Welding or cutting in elevated positions shall be conducted only under safe conditions. A full safety body harness connected to safety lines shall be worn at certain heights and above (see Section *SE-MSHE-WOR-PRO-0030 Working at Height*). Warning signs, warning tape and ceramic rugs shall be placed below areas where welding or cutting is being conducted where slag and sparks would fall down and may injure personnel, damage equipment, or cause ignition.

7. PRE-HEATING AND POST-HEATING

Extra planning is required where it is required to pre-heat and/or post-heat a work piece as part of the welding procedure. In particular the need to provide safety cover for the total work period, including the natural cool-down phase must be borne in mind. In many cases, where heavy gauge plate work or large sections are involved, it may be many hours before all heat has been dissipated and the temperature is low enough to be considered safe.

8. HOT WORK IN A CONFINED SPACE

This procedure for entering and working in a confined space is set out in Section SE-MSHE-WOR-PRO-0013 *Confined Space Entry.*

Never enter a tank or vat to carry out cleaning or hot work unless you are suitably trained. Any work in confined spaces is extremely dangerous and should not be attempted by inexperienced people.

Do not attempt to weld, cut or grind if the presence of explosive vapors or dusts is suspected. Test the atmosphere with a suitable gas detector.

Keep welding plant outside the confined space and run leads only to the work area.

When welding in a confined space ensure that the attendant understands the welding plant being used and is able to shut it down properly and quickly in an emergency.

Remove gas torches and hoses or leads from the space every time that work stops - even for tea breaks. A small leak, even for a short time, could result in an explosion when work re-starts.

9. GAS WELDING AND CUTTING

9.1 GENERAL SAFETY

Never use oxygen to blow dust off clothing as the increased oxygen concentration trapped in the fabric can cause clothing to become highly flammable, burning as if were soaked in petrol. Likewise never use oxygen to ‘sweeten’ the air.

Acetylene forms an explosive mixture with oxygen at concentrations ranging from 2% - 82%. Leaking acetylene is easily identified by its garlic or onion smell.

Copper forms an explosive compound (copper acetylate) with acetylene which is likely to explode on impact. For this reason never use copper or any material containing more than 70% of copper to join acetylene hoses. The proper fittings must always be used.

Acetylene is an unstable gas and dangerously so at pressures over 100kPa. For this reason the regulator on the gas equipment must never be set higher than this pressure.

LPG (used in cutting) is heavier than air and will therefore collect in low-lying places. For this reason it should not be used in trenches, holes or places where it can spill down to a lower level. LPG forms an explosive mixture with oxygen at concentrations of between 2% and 10%.

When lighting up gas welding and cutting equipment always use friction or electric lighters, never use a cigarette lighter or matches. Correct light-up and shut-down procedures and sequences must always be followed.

Flashback arresters must be used on all gas welding and cutting equipment.

Key spanners shall be left in position on cylinders when in use so that they can be closed quickly in an emergency.

Hoses must not be wrapped around cylinders or regulators, as a leak or flashback could cause even more damage. Instead, they should be looped around a hook or similar.

Gas equipment should be regularly (see the site Planned Maintenance Schedule for details) checked for leaks by using soap and water or a proprietary leak finding solution such as ‘Snoop’.

Care should be taken to keep hoses and other equipment from obstructing passageways, ladders and stairways.

Never use oxygen to run pneumatic power tools as any oil or grease in the tool may burst into flames or explode.

Never fill oxygen cylinders with compressed air from an oil lubricated compressor. This is because residual oil in the air will be deposited in the cylinder. If the cylinder were then refilled with oxygen, an explosion will occur. Any oxygen equipment that has been used with compressed air must be downgraded and not used for oxygen again.

Never lubricate with grease or oil, any equipment that will be used for oxygen service. These substances can ignite violently in the presence of oxygen, and if the oxygen is under pressure an explosion may result.

9.2 STORAGE AND HANDLING OF CYLINDERS

Do not use unlabeled or unmarked cylinders. If cylinders are unlabeled or unmarked then they must be returned to the supplier.

Cylinders are to be stored safely and securely in such a way that they are prevented from falling. Cylinder Caps must always be fitted before a cylinder is moved, unless it is secured in a purposed made trolley. Do not store cylinders near elevators, stairs or gangways or in unventilated enclosures such as cupboards. All cylinders must be kept away from electrical apparatus, heat and other sources of ignition.

Oxygen cylinders shall be stored separately from fuel gas cylinders and empty cylinders must be stored separately from full ones and with their valves closed and caps on.

Cylinders must be handled one at a time and if necessary, lifting assistance should be provided only by means of rope slings, not by chains or magnetic lifts.

Keep all oxygen cylinders and fittings in a place where they cannot be contaminated by oil or grease.

Always store and use acetylene cylinders in the upright position. Acetylene cylinders are filled with a porous material that contains acetone into which the acetylene is dissolved.

The acetone keeps the acetylene stable. If the valve is opened when the cylinder has been on its side, the liquid acetone will be withdrawn with the gas. If a cylinder has been on its side, stand it upright for at least one hour before use.

Similarly, LPG cylinders should be stored and used upright as LPG is a liquid which is likely to seep through the valve.

For more details on the storage of gas cylinders, refer to Section 13: *Hazardous Substances*.

9.3 CHECKS

All gas cylinders, supply hoses and ancillary equipment must be checked regularly to ensure they remain in good condition. Special attention should be given to ensuring that supply hoses are free of any signs of cracking of the rubber coating.

10. ELECTRIC ARC WELDING

All care must be taken through the use of appropriate shielding to protect personnel, including passersby, from the hazards of ‘arc-eye’.

Under normal operating conditions it is not possible to get an electric shock from an electric welder. Should anyone receive one, the power supply must be shut off and disconnected. The machine must not be restarted until it has been cleared by a registered electrician.

Always treat all electrical equipment as ‘live’. Do not take chances. Keep water and other liquids away and keep yourself dry. Do not arc weld in wet conditions. A reliable automatic control must be fitted to reduce the no-load voltage if it is unavoidable for AC welding to be performed under wet conditions. This is to prevent shock.

- Use an isolating transformer with all portable electrical equipment.
- Keep leads and cables clear from obstructing passageways, ladders and stairways.
- Use only cables of a sufficient capacity to carry the current used. Do not overload.
- Use only a proper earthing clamp or bolted terminal. Never earth to pipelines carrying gas or flammable liquids, or to conduits carrying electric wires.
- Use only standard cable connectors.
- Use only an insulated hook or other suitable device to hold the electrode holder when it is not actually being used.
- If using a welding generator driven by an internal combustion engine inside a building or confined area, the engine exhaust must be ducted to the outside air.
- Input cables and extension leads should be kept tidy and as short as practical (try to use suitable lengths with as few connectors as possible).

- Take particular care in earthing portable welding machines driven by an internal combustion engine. Where an earthing connection is provided, it must be used in accordance with the manufacturer's instructions. (This is also very important when using ancillary power supply for drills, grinders and other equipment.)

10.1 CHECKS

The checks listed below should be carried out before using electric welding equipment.

- If the machine has become wet, disconnect the primary power and dry out before use
- Check the welding cable for insulation damage
- Reject all welding lead spliced within 3m of the holder
- Check MIG or TIG gas hoses and fittings for leaks
- Check electrode holders for loose or exposed connections to reduce shock hazard
- Check the welding machine is earthed, paying particular attention to the condition of the earth connections.

11.HOT WORK PERMIT

Before any hot work can be carried out in a designated area or on tanks and drums a 'Hot Work Permit' must be obtained. This will always be under cover of a General Work Permit (Refer to SE-MSHE-WOR-PRO-0014: *Permit To Work System*). The Hot Work Permit is presented at the end of this section.

Before hot work requiring a permit is carried out, the need for hot work should be questioned. If it is practical to carry out the jobs without hot work then hot work should not be done.

The 'hot work permit' identifies whether a firewatcher is required and, if so, how many.

A 'hot work permit' **is required** for the following situations:

- any hot work within the power plant
- any hot work within buildings
- any hot work near or adjacent to operating mechanical equipment, pressure piping or pressure vessels, hydrocarbon pumps, producing wells, gas compressors or any other fuel source
- any hot work in a hazardous area
- any hot work on vehicles
- any hot work on tanks or drums no matter the location
- any hot work anywhere that a 'confined space permit' has been raised
- any other time when a relevant hazard is perceived to exist.

A ‘hot work permit’ **is not required** under the following situations:

- normal hot work within the workshop
- hot work in non-hazardous open-air situations
- hot work in approved areas designated as safe for unrestricted hot work.

11.1 SAFE HOT WORK AREAS

These areas will be identified by the site safety committee and communicated in map form in the appropriate arrangement for Site Specific Safety.

11.2 CONSIDERATIONS

A shift or department supervisor who is satisfied that it is safe to proceed with the work is the only person able to approve a ‘hot work permit’.

Prior to performing any hot work in other than an approved safe hot work area, the ‘person in charge’ shall review the operations to be performed with the relevant supervisor.

11.3 PRECAUTIONS

The following precautions must be taken.

- When working on pipe systems, all lines in the work area shall be traced to confirm both that the correct system has been identified, and that there is no risk from other systems nearby. Associated hazards are to be considered carefully.
- All lines on which welding is to be performed shall be blown down. In certain cases where it may be unsafe to blow down the line being worked on, a hot tap procedure approved by the Operations Senior Supervisor or Production Senior Supervisor may be used.
- Operation of valves, on effected systems, is prohibited during welding operations.
- Portable gas detectors shall be used to ensure no combustible mixtures are present before and frequently while, performing hot work around tanks, pressure vessels, compressors, all enclosed areas or other areas where gas may be present.
- Where hot work is to be carried out near to ventilation intakes and compressor suctions, ensure that the equipment is shut down and tagged off under the relevant General Work Permit. Do not un-tag the equipment until the fumes and smoke have cleared.

A copy of hot work permit form and a hot work checklist can be found at the end of this section.

12.HAZARDOUS HOT WORK ON TANKS AND DRUMS

12.1 GENERAL

Severe explosions and fires can be caused by the application of heat to pipes, tanks, drums and similar vessels which have contained flammable materials. In some cases only a pin point of heat or a spark can be enough to set off an explosion.

Personnel should be wary of trusting what container labels say. A label may not correctly indicate the contents, as a container may have been used to store other substances.

If one compartment of a two-compartment tank has to be repaired, cut or ground, then both compartments must be made safe.

12.2 HAZARDOUS HOT WORK SUBSTANCES

Substances that pose a hot work threat are and may have been in tanks or drums:

- any volatile liquid that releases flammable vapor at atmospheric pressure (e.g. petrol, acetone, white spirits, etc.)
- any non-volatile oils or solids that release flammable vapor when heated (e.g. diesel oil, tar, greases, linseed oil, tallow, soap, etc.)
- any acids that react with metals to form hydrogen (e.g. sulphur acid, nitric acid, hydrochloric acid, etc.)
- any combustible solids or finely divided particles which may be present in the form of an explosive dust cloud (e.g. fiberglass, milk powder, sulphur, etc.)
- any chemical compound that decomposes and forms a hazardous vapour when heated.

12.3 CLEANING OF TANKS AND DRUMS

There are essentially three cleaning methods which are:

- the ‘washing method’ for soluble substances
- the ‘boiling method’
- the ‘steaming method’ for insoluble substances.

Care must be taken to ensure that a container is properly cleaned before hot work is carried out. Shortcuts at this stage may be fatal.

Prior to cleaning, the container must be thoroughly emptied of the substance which must be disposed of carefully check Material Safety Data Sheet (MSDS). If caps or bungs need to be removed then non-sparking type tools (e.g. those made of bronze) are to be used. If the container has held a corrosive or toxic substance then, rubber or PVC gloves and a face shield or goggles to protect eyes from splashes are to be worn.

12.3.1 Washing Method

The container must be filled with water and drained several times. This method is suitable only for water soluble substances. This method is particularly suitable for acids such as hydrochloric or sulphur acid.

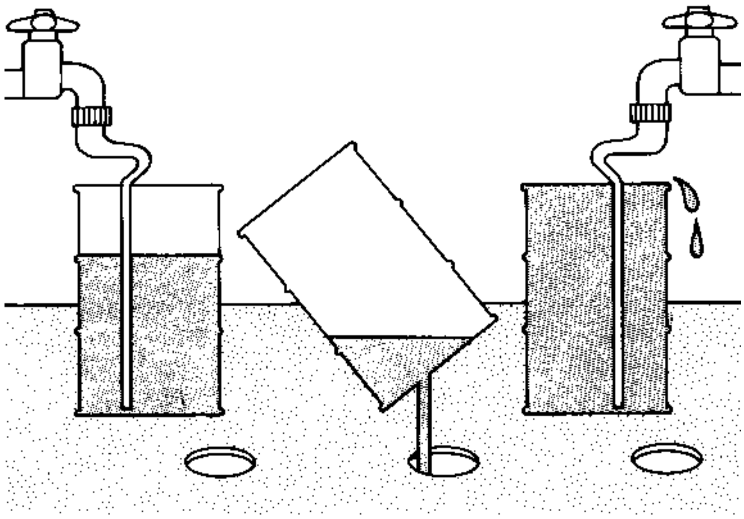


Figure 20.1: Washing with Water

12.3.2 Boiling Method

The item to be cleaned must be completely immersed in the boiling water so that water fills, as well as surrounds, it. It is essential that proprietary degreasing detergent (not household detergent) is added to the water, particularly if the tank has held petrol, paraffin, diesel, oil, grease, etc.

Strong alkalis such as caustic soda will attack aluminum and its alloys, producing hydrogen. If containers need to be treated with alkalis, then one of the weaker cleaners should be used. Overalls, a PVC apron, gloves and safety glasses or a face shield must be worn to prevent strong alkaline cleaners being splashed onto skin or into eyes.

Fabric or leather gloves should be worn when handling containers that have been steamed or boiled as the metal becomes very hot.

12.3.3 Steaming Method

Steam volatilizes oils and greases and is particularly suitable for tanks and drums that have held these substances.

If the container has held a highly flammable substance, then precautions must be taken to prevent the accumulation of static electricity. The tank and steam pipe should be earthed and the steam pipe should be electrically bonded to the tank.

It is important that an outlet be provided for the steam so that pressure does not build up and to allow condensates and sludge to drain away.

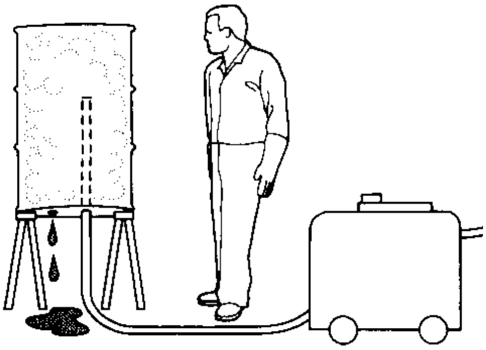


Figure 20.2: Steaming

Containers should be steamed for no less than 30 minutes after every part of the container has become too hot to touch. Checking that the condensate is free of oil or other material is a good indication of whether cleaning is complete.

12.3.4 Trichloroethylene (or 1,1,1-Trichloroethane)

(These products must be used with great care as they are highly toxic and are generally not recommended)

Stubborn oil sludge deposits may be washed out with trichloroethylene (or 1,1,1-trichloroethane) but these products must be used with caution in well ventilated areas as they have a narcotic effect. Treatment must be followed by a further cycle of steaming because of the possible fire or toxic hazards and the risk of forming poisonous phosgene gas when heat is applied.

12.3.5 Cleaning Methods NOT to be Used

Blowing out with compressed air as this method does not remove solids and residual deposits that are capable of producing fumes.

Cleansing with carbon tetrachloride as this solvent is inherently toxic and may form poisonous phosgene gas when heat is applied. It may also react with the metal on the drum.

Cleansing with trichloroethylene or 1,1,1-trichloroethane is not recommended and must only be used as a last resort as discussed previously.

12.3.6 Checking

Following cleaning, the inside of the container must be checked for residual vapors or solids. It should be noted that any equipment such as torches etc. must be safe for use in flammable atmospheres.

An item can be considered safe for hot work when no solid residues or vapors can be detected by sight or smell. If an instrument such as an explosimeter is used, the absence of a reading does not necessarily mean that the container is safe to weld. This is because the meter tests at atmospheric temperature, not at welding or grinding, etc. temperatures.

If following cleaning flammable vapors or sludge deposits are detected, then the cleaning process should be repeated or the vessel should be 'inerted' prior to carrying out hot work.

12.4 ADDITIONAL PRECAUTIONS - 'INERTING'

12.4.1 General

As an additional precaution, but not instead of cleaning, the vessel can be 'inerted' by replacing the air in the vessel with water, steam or an inert gas.

12.4.2 Filling with water

If using electric welding gear to make a repair, then the vessel should be completely filled with water. A vent should be fitted to relieve any pressure generated by steam. Care must be taken to ensure the welding equipment does not get wet.

If making a repair by soldering, brazing or oxy-acetylene welding near an opening in the vessel, the vessel should be filled with water leaving a small free air space at the point where the repair is to be made.

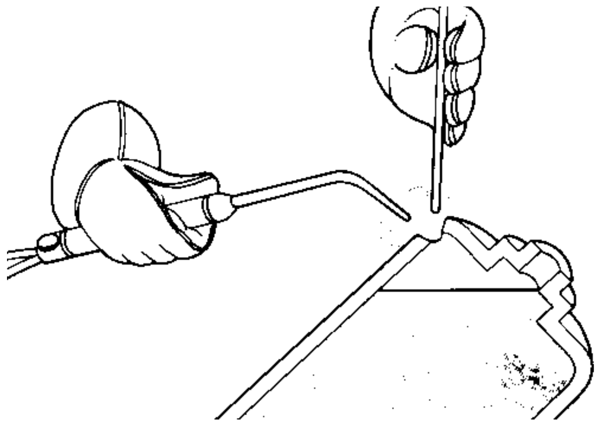


Figure 20.3: Filling with Water

12.4.3 Continuous Steaming

This procedure is essentially the same as for steam cleaning, except that steam is allowed to continually flow through the tank during the welding operation.

12.4.4 Filling with Carbon Dioxide

Care needs to be taken that all the air in the tank is displaced and also that the carbon dioxide does not leak from an exit point at the bottom of the tank as carbon dioxide is heavier than air.

As a general guide at least 0.5kg of dry ice should be added per 250 liters of tank capacity to ensure that the tank is completely filled with CO_2. Note that dry ice is very cold and should only be handled with gloves or tongs. This method is only suitable for small tanks (up to about 1000 liters). In larger tanks, the CO_2 gas will be so cold and heavy that only the atmosphere at the bottom of the tank will be inerted.

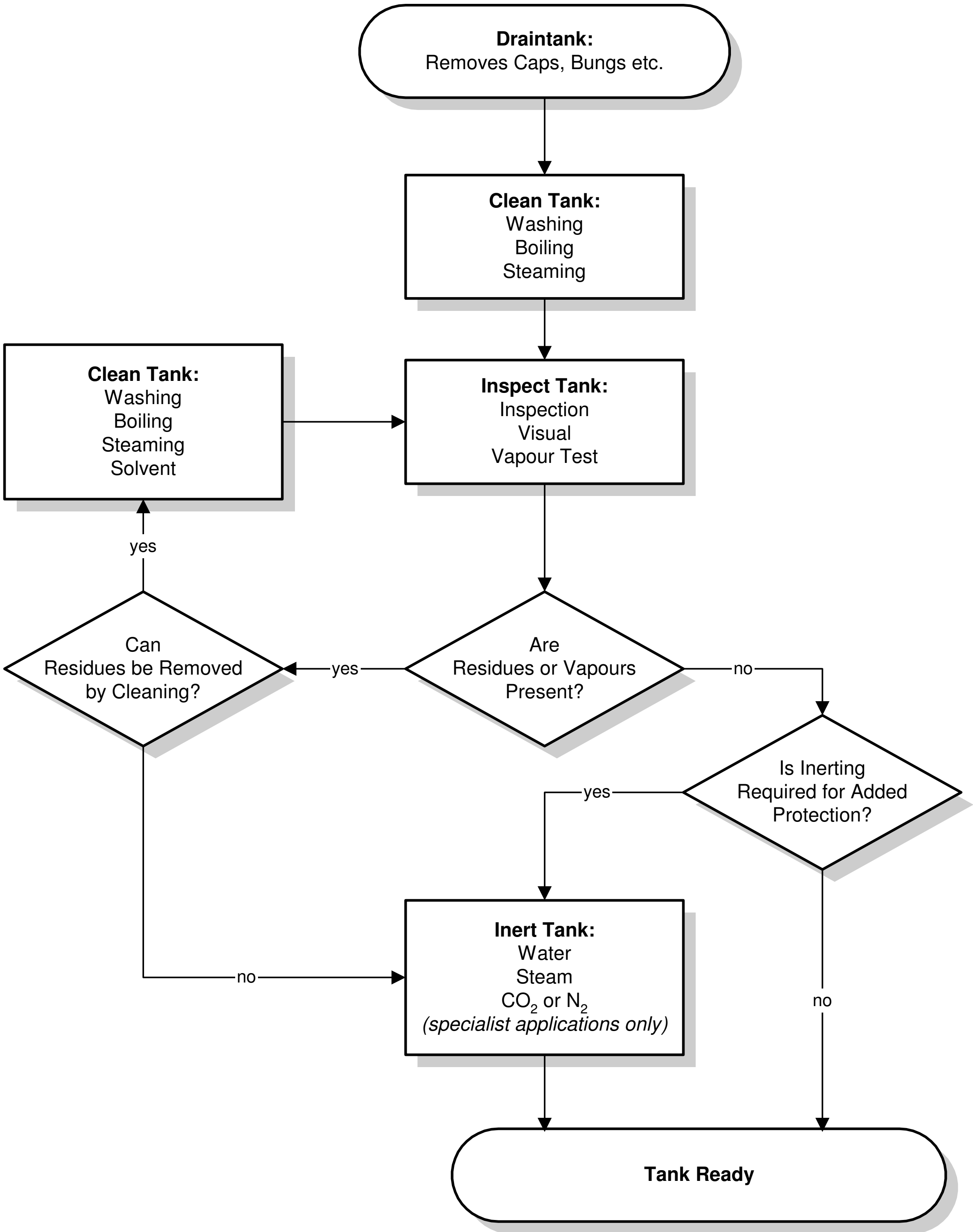
While CO_2 is not toxic, it does not support life and no one without breathing apparatus is to enter a tank containing it. Adequate ventilation must be provided in the area or vicinity of the tank.

12.4.5 Filling with Nitrogen

It is recommended that only people with the necessary expertise use this method. Nitrogen is suitable for inerting the atmosphere in large tanks (e.g. in the oil industry). It is important that the tank is completely filled with nitrogen. A light flow of gas must be maintained throughout the welding operation and during breaks.

While nitrogen is not toxic, it does not support life and no one without breathing apparatus is to enter a tank containing it. Adequate ventilation must be provided in the area or vicinity of the tank.

Figure 20.4: Cleaning of Tanks and Drums for Hot Work



12.5 RETURNING TO SERVICE

In addition to the usual closing up checks tanks, drums, or vessels should be checked for residues of chemicals, solvents and cleaners as, they may react with the substances that the vessel is to hold (check the MSDS).

13.SAFETY EQUIPMENT

Goggles, face shields or protective glasses shall be worn when burning, welding, grinding, or striking metal, no matter how small the job may be. Also, all persons employed as assistants to a welder, or those who have to work near the welding point, shall wear suitable eye protection. Helmets or shields that have cracks, splits or pinholes shall not be used. Similarly, a cracked or broken filter glass shall not be used even for the smallest job.

Figure 20.5: Safety Equipment

Safety goggles must always be worn for chipping or grinding, or when in an eye danger area.

All welding operations in the open air and close to fellow workers or other people shall be suitably screened to prevent eye injury, ingress of wet weather, to contain flying sparks and to protect others from ultraviolet radiation and the effects of ‘arc-eye’.

Hearing protection must be worn when performing noisy operations such as grinding and chipping. Refer to Section …: *Personal Safety Equipment (PPE).*

Industrial, overalls (made from flame resistant fabrics such as cotton) and appropriate eye protection shall always be worn when engaged in welding and cutting operations. Overalls should be kept fastened up to the neck, with the sleeves down and fastened about the wrist. Gloves or gauntlets shall be worn for arc welding, as protection against shock, burns and radiation burns.

If fumes given off from the work are highly toxic, such as those from cadmium, chromium, or beryllium, then some form of respiratory protection, such as an air-supplied helmet, is still necessary even if the work is in a well-ventilated area.

Hot Work Checklist

Before approving any cutting and welding work the General Work Permit Holder and where appropriate, the area supervisor is to inspect the work area and confirm that precautions have been taken to prevent fire.

PRECAUTIONS
- ☐ Sprinklers in service (or disabled if work may cause mal-operation of system)
- ☐ Cutting and welding equipment in good repair

WITHIN SURROUNDING AREA
- ☐ Area clear of combustibles
- ☐ Combustible floors wetted down, covered with damp sand, metal or other shields
- ☐ No combustible material or flammable liquids
- ☐ Combustibles protected with covers, guards or metal shields
- ☐ All wall and floor openings covered
- ☐ Covers suspended beneath work to collect sparks
- ☐ Covers over sensitive equipment

WORK ON OR NEAR WALLS AND CEILINGS
- ☐ Construction non-combustible and without combustible covering
- ☐ Combustibles moved away from opposite side of wall

WORK ON ENCLOSED EQUIPMENT
(Tanks, containers, ducts, dust collectors, etc.)
- ☐ Equipment cleaned of all combustibles
- ☐ Containers purged of flammable vapors

FIRE WATCH
- ☐ To be provided during and at least 30 minutes after operation
- ☐ Supplied with extinguisher, sand bucket, small hose or other suitable equipment
- ☐ Trained in use of equipment and in sounding fire alarm

FINAL CHECK-UP

- ☐ To be made 30 minutes (or greater period if applicable) after completion of any operation

supremeenergy	**SAFETY HEALTH AND ENVIRONMENT** **PERSONAL PROTECTIVE EQUIPMENT**	**PROCEDURE**
CORPORATE	**PERSONAL PROTECTIVE EQUIPMENT**	SE-MSHE-PPE-PRO-0001 Revision: 0

APPROVAL

	POSITION	NAME	SIGNATURE	DATE
Prepared by	SHE Engineer	Erwin Patrisa Floris		
Reviewed By	Sr. SHE Manager	M. Arief Tarunaprawira		
Approved By	VP. Relation & SHE	Priyandaru Effendi		17/05/2013

REVISION HISTORY

REV	DATE	BY	REVIEWED	APPROVED	DESCRIPTION
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1. PURPOSE

This section describes **SUPREME ENERGY** (the Company) Safety Standards to control the use, maintenance and selection of personal protective equipment (PPE).

Where a hazard cannot be controlled through other measures, the use of personal protective equipment or clothing is appropriate as the last resources to prevent injury or occupational illness. The use of personal protective equipment must be considered carefully to ensure that it is of the correct type and is properly used and maintained.

This requirements stated in this section shall apply to all activities for which personal protective equipment is required by appropriate safe work practices.

2. DEFINITIONS

Respiratory Protection	Protective equipment designed to enable persons to breathe when toxic gases, vapors or dusts are present, or there is insufficient oxygen.
Oxygen deficiency	Insufficient oxygen in air.
Dusts	Particles formed when solids are broken down, such as by sanding or grinding or excavation.
Fumes	Fine particles in air formed when metal is melted, vaporized, then quickly cooled.
Mists	Tiny liquid droplets suspended in air.
Gases	Gas-phase contaminants that can be toxic.
Vapors	Substances that evaporate from a liquid or solid.
Particulate	Includes dusts, mists and fumes.
Irritants	Substances that can cause discomfort or minor irritation but no tissue damage

3. APPLICATIONS

Every personnel when working at the facility shall wear suitable protective clothing and use protective equipment appropriate to the work being undertaken. **Protective clothing/equipment shall be worn and/or used as required without exception. This applies to SUPREME ENERGY personnel, visitors, contractors and sub-contractors alike.**

The minimum required PPE consists of a hard hat, safety glasses, safety shoes and appropriate clothings (long-sleeve shirt and pants). Additional PPE may be required, depending on worksite conditions as may be specified in the Health, Safety and Environment (HSE) Procedures, or in location-specific signs and notices.

Construction areas, indoors and outdoors, are designated PPE areas with minimum PPE requirements.

Care should be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of each of the hazards should be taken.

Exceptions to the minimum PPE procedure are as follows: personnel working within offices, administrative areas, living quarters, villas, or heliports (PPE may be required, depending on work being performed and worksite conditions).

4. GENERAL REQUIREMENT

- Compliance to PPE requirements is the responsibility of both the individual employee and the Department or Group related to the job.
- Supervisors are required to assess the workplace to determine if hazards that required the use of PPE are present or likely to be present.
- Supervisors must certify in writing that a workplace hazard assessment has been performed (Job Safety Analysis / JSA, Work Procedure) to determine the requirement of PPE.
- Use PPE properly as per manufacturer instructions.

5. RESPONSIBILITIES

Company	SUPREME ENERGY shall ensure that all protective equipment required for the safe execution of tasks is available to all personnel, and that a record of distribution of non-consumable personal protective equipment is kept.
Contractor	All physical activities and services within SUPREME ENERGY facilities conducted by contractors is mandatory to fulfill this procedure. This requirement shall be covered in each contract under HSE exhibits.
Line Managers and Supervisors	Line Managers and Supervisors shall ensure that personnel are trained in the use and maintenance of personal protective equipment.
Supervisors	• Shall ensure that personnel are supplied with appropriate personal protective equipment, and that the equipment is maintained. • Supervisors shall ensure that all members of the work party and all contractors and sub-contractors are wearing appropriate protective clothing and/or equipment.
Management	• Management shall ensure that all personnel are directed and instructed in the use, care, fitting and maintenance of personal protective equipment. • Management shall keep a record of details of training and persons approved for use of respiratory protection.
All Personnel	• All personnel shall be responsible for the care of personal protective equipment issued to them, including the correct use, cleaning and

maintenance of the equipment.

- If personal protective equipment is not available, or is inadequate for a task, or if insufficient training has been provided, the personnel shall inform Management so that suitable equipment can be provided.

6. INSPECTION AND MAINTENANCE

- As a reminder for personal safety equipment to function correctly and not to fail putting the wearer at risk they shall be kept clean and well maintained. Defective items shall be replaced and never used.

- All PPE users shall inspect each PPE prior to utilizing. Defective PPE shall be replaced immediately and reported to their Supervisors.

7. TRAINING

Prior to using PPE, employees shall be trained to gain knowledge of:

- When PPE is necessary?
- What type is necessary?
- How it is to be worn ?
- Its limitations and useful life.
- How to care, maintain, and dispose the PPE

Supervisors shall certify in writing that training has been carried out and that employees understand it. Each written certification shall contain the name of each employee trained, the date(s) of training, and identify the subject certified. Signed attendance list by Supervisor is considered as training certificate.

8. HEARING PROTECTION

8.1 General

This section should be read in conjunction with Chapter 2: Section …: *Noise and Vibration*. As stated in Chapter 2: Section …: *Noise and Vibration* alternative measures to reduce noise levels effectively should be carefully considered before hearing protection is implemented.

Hearing protection shall be worn under the following circumstances:

- in an area sign posted “hearing protection required”.

Figure 1 : Sign Indicating Hearing Protection Shall be Worn in this Area

- For tasks where hearing protection is required as defined in appropriate Safe Work Practices.
- Where noise levels have been measured to be above 85dB(A) over a period of 8 hours.
- Where noise levels have been measured to be over 115dB(A) over any length of time.
- a good rule of thumb is if where one needs to raise one's voice to communicate with someone within 2 meters.

Training for the use of hearing protection will be done as part of the general induction training. Hearing protection refresher training will be conducted periodically. Personnel will also be fitted and issued with hearing protection at this training as appropriate.

Audiometric testing shall be performed before employment and shall be repeated periodically as part of routine medical checkup for employee.

8.2 Selection

There are two main types of hearing protection that can be used:

- ear plugs,
- ear muffs.

There are several types of ear plugs, but the basic principle is the same for all types: they are a form of bung that is pushed into the ear canal.

A list of the advantages and disadvantages of air plugs and air muffs is given below in Table 1.

Table 1 : Advantages and Disadvantages of Ear Plugs and Ear Muffs

Advantages	Disadvantages
Ear Plugs	
• Easier to wear for most people - they are not hot or bulky and can be worn with other equipment • Disposable types are available	• Must be carefully fitted and periodically checked • Clean hands must be used to insert or remove plugs • Do not provide protection over 97dBA
Ear Muffs	
• One size will fit most people • Can be attached to hard hats • Greater protection can be provided (Note some activities will require the use of high efficiency ear muffs) • They are easy to remove and replace - an advantage for people who frequently move from a noisy place to a quiet place	• May make ears hot • Are bulky • Efficiency may be reduced if worn with spectacles, respirators etc.

Following an initial review of noise exposures, various areas will be designated hearing protection zones.

In most situations there will be a selection of protective devices that have the required hearing protection grade (i.e., a choice of ear muffs or plugs). In these cases, the individual workers will select the type of hearing protection that is most practicable for them. This is because the most important factor in achieving a high degree of hearing protection is that the hearing protection be worn at **all** times when the personnel is exposed to excessive noise.

Hearing protection shall be used when personnel are exposed to excessive noise levels and exposure time, as stated in OSHA Permissible Noise Exposure as listed in Table 2 below.

Table 2 : Noise / Sound Level, Exposure Time and Hearing Protection Grade

Duration per day (hours)	Noise Level dBA (slow response)	Hearing Protection Grade
8	85	1
6	92	2
4	95	
3	97	3
2	100	
1 ½	102	
1	105	4
½	110	5

¼ or less	115	

There are standards for hearing protection grades. Hearing protective devices will be labeled as to meeting one of the grades. When using Hearing Protection Devices, one shall refer to its Noise Reduction Rate (NRR).

Grade 5 ear muffs provide the highest level of hearing protection. In some instances, ear plugs and Grade 5 ear muffs will be required to be worn together in order to provide sufficient protection. For example work in the vicinity of the venting of steam via a rock muffler.

8.3 Use

The removal of hearing protectors for even very brief periods of time can dramatically reduce their effectiveness and lead to under-protection for the wearer. Where hearing protection is required, it must be used at all times. Failure to wear hearing protection when required could result in damage to hearing.

Management shall ensure that "quiet" locations or periods are available for personnel to have breaks from noisy activities and wearing hearing protection.

When using hearing protection, it is much more difficult to hear instructions or warning noises. This should be taken into account for work practices, and alternative arrangements shall be made for communication and warnings.

8.4 Maintenance

Personnel should regularly inspect their hearing protectors to detect damage or deterioration. Disposable earplugs shall not be reused due to the risk of ear infection. Reusable ear plugs shall only be used by one person.

Ear muffs shall be replaced if their acoustic packing becomes loose, or where the padding is worn, damaged or missing. Checks should be carried out before use to ensure padding and packing condition is adequate.

Adequate provision should be made for clean storage of protectors when not in use. Facilities should be readily available for the cleaning of reusable protectors. Hearing protection devices should be cleaned and disinfected according to the manufacturer's instruction.

9. EYE AND FACE PROTECTION

9.1 General

Eye and face protection shall be worn when a job assignment or work area indicates the need for such protection.

Eye and face protection should be worn where there is a possibility of injury from:

- flying particles,
- chemical vapors or gases,
- chemical liquids, acids or caustic,
- molten metal.

Personnel working on a task which has the potential to cause eye injury shall wear appropriate eye protection such as full-face shields or safety glasses. Examples are working with grinders, breaking glass, lathes, drills, etc. as specified in appropriate Safe Work Practices. Other areas in which eye protection is required (e.g. the laboratory) will be sign-posted.

Training for the use of eye protection will be done as part of the general induction training.

9.2 Selection

Protective eyewear and face includes, but is not limited to:

- prescription and non-prescription safety glasses,
- welder's goggles and shields,
- chemical splash goggles,
- impact-type goggles,
- face shields,
- full-face respirators.

The type of eye protection available, together with their description and uses is briefly described in Table 3 below.

Table 3 : Eye and Face Protection Selection

Source	Assessment of Hazard	Protection
IMPACT-Chipping, grinding machining, masonry work, woodworking, sawing, drilling, chiseling, powered fastening, riveting, and sanding	Flying fragments, objects, large chips, particles sand, dirt, etc	Spectacles with side protection, goggles, face shields. See notes (1), (3), (5), (6). For severe exposure, use face shield
HEAT-Furnace operations, pouring, casting, hot dripping, and wielding	Hot sparks	Face shields, goggles, and spectacles with side protection. For severe exposures, use face shield. See notes (1), (2), (3)
	Splash from molten metals	Face shields worn over goggles. See notes (1), (2), (3)
	High temperature exposure	Screen face shields, reflective face shields. See notes (1), (2), (3)
CHEMICALS-Acid and chemicals handling, decreasing plating	Splash	Goggles, eyecup and cover types. For severe exposure, use face shields. See note (3)
	Irritating mists	Special-purpose goggles
DUST-Woodworking, buffing, general dusty conditions	Nuisance dust	Goggles, eyecup and cover types. See note (8)

Continue Table 3 : Eye and Face Protection Selection

Source	Assessment of Hazard	Protection
LIGHT and/or RADIATION		
- Welding: Electric arc	Optical radiation	Welding helmets or welding shields. Typical. Shades: 10-14. See note (9) and see Filter Lenses for Protection Against Radiant Energy Table
- Welding: Gas	Optical radiation	Welding goggles or welding face shields. Typical shades: gas welding 4-8, cutting 3-6, brazing 3-4, See note (9)
- Cutting, Torch brazing, Torch soldering	Optical radiation	Spectacles or welding face shields. Typical shades, 1.5-3. See notes (3), (9)
- Glare	Poor vision	Spectacles with shaded or special purpose lenses, as suitable. See note (9)

Caution notes:

1. Care should be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of each of the hazards should be provided. Protective devices do not provide unlimited protection.
2. Operations involving heat may also involve light radiation. As required by the standard, protection from both hazards must be provided.
3. Face shields should only be worn over primary eye protection (spectacles or goggles).
4. As required by the standard, filter lenses must meet the requirements for shade designations. Tinted and shaded lenses are not filter lenses unless they are marked or identified as such.
5. As required by the standard, persons whose vision requires the use of prescription (Rx) lenses must wear either protective devices fitted with prescription (Rx) lenses or protective devices designed to be worn over regular prescription (Rx) eyewear.
6. Wearers of contact lenses must also wear appropriate eye and face protection devices in a hazardous environment. It should be recognized that dusty and/or chemical environments might represent an additional hazard to contact lens wearers.
7. Caution should be exercised in the use of metal frame protective devices in electrical hazard areas.
8. Atmospheric conditions and the restricted ventilation of the protector can cause lenses to fog. Frequent cleansing may be necessary.
9. Welding helmets or face shields should be used only over primary eye protection (spectacles or goggles).

Note :

For grinding operations (both handheld and bench type) the operator must wear full face shield over approved safety glasses or goggles.

Table 4 : Filter Lenses for Protection Against Radiant Energy (*)

Operation	Electrode Size 1/32 Inch Diameter Standard (torch)	Arc Current (AMPS)	Minimum Protective Shade
Shielded metal arc welding	< 3/32 3/32-5/32 5/32-8/32 > 8/32	< 60 60-160 160-250 250-500	7 8 10 11
Gas metal arc welding and flux cored arc welding		< 60 60-160 160-250 250-500	7 10 10 10
Gas Tungsten arc welding		< 50 50-150 150-500	8 8 10
Air carbon arc cutting	(Light) (Heavy)	< 500 500-1000	10 10
Plasma arc welding		< 20 20-100 100-400 400-800	6 8 10 11
Torch brazing Torch soldering Carbon arc welding		- - -	3 2 14

(*) Reference ANSI Z87.1-1989

9.3 Use

Where eye and/or face protection required, it shall be used at all times. Failure to wear eye and/or face protection when required could result in permanent eye damage or blindness.

Glasses or visors should fit well, so that they do not move or slip whilst being worn.

Impact-type eye protection (goggles) shall be worn when chipping, scraping, grinding, hammering or any activity involving flying or falling objects or particles.
Splash-proof chemical goggles shall be worn when handling hazardous chemical liquids or in any other operation where the eyes may be exposed to hazardous chemicals in either liquid or solid form.

Goggles are also required when:

- dust hazards exist,
- working on lines, vessels, etc., where vapor, gas, air, fluid, or solid may be trapped under pressure,
- cutting and tying of cable or wire rope, or

- operations where there is danger from the spraying of oils or chemicals.

9.4 Maintenance

Personnel should inspect eye and face protection regularly to detect damage or deterioration.

Lenses shall be kept clean, otherwise visibility will be obscured. Warm water and washing liquid applied with a soft cloth is effective for lens cleaning. Facilities should be readily available for the cleaning. Adequate provision should be made for clean storage of protectors when not in use.

10. HEAD PROTECTION

10.1 General

Safety helmets (or hard hats) provide protection when working in areas where there is a potential for head impact or penetration from falling or flying objects.

In addition, protective headwear designed to reduce electrical shock hazard should be worn by employees when near exposed electrical conductors that could contact the head. Specified hard hat areas include exploration and production fields, construction sites and power plants.

Hard hats are the primary form of protection. Hoods and neck protection may also be necessary where there is a risk of hazardous substances entering via the collar.

Hard hats are divided into three classes:

- Class G - general service, limited voltage protection up to 2,200 volts. (Formerly class A).
- Class E - utility service, high-voltage protection up to 20,000 volts, use extensively by electrical workers. (Formerly class B).
- Class C - special service, no voltage protection.

Hard hats shall meet ANSI Z89.1 Class C or E specifications or SUPREME ENERGY approved equivalent.

10.2 Selection & Use

Where hard hats are required, hard hats with ratchet type suspension system must be worn at all times. Chin strap must be used when working at height.

Hard hats shall be worn under the following types of conditions:

- At construction sites.
- When working on or near hoists, A-frames, or overhead gantries.
- In any area where overhead work is occurring or conditions require head protection - in and around tanks and low overhead work areas.
- In areas where other departments or SUPREME ENERGY require hard hats.
- In any posted areas.

- Metal hard hats are not permitted within the SUPREME ENERGY area of operations.
- Validity of hard hats shall be in accordance with the manufacturer instruction.
- The outer shell of hard hats should not be drilled, cut, damaged, or otherwise modified in any way that will affect structural integrity, unless approved by the manufacturer.
- The painting of hard hats is prohibited as it may affect their impact resistance. Name tags shall be affixed with glue, do not engrave hard hats.

10.3 Maintenance

Suspension systems (plastic support placed within the hard hat) should not be removed from a hard hat.

Hard hats should be stored out of direct sunlight. Do not carry or store hard hats on the rear windows shelf of an automobile, since sunlight and extreme heat may adversely affect the degree of protection.

Plastic hard hats become more brittle and weaken over time, due to UV degradation.

All components i.e. shells, chin strap, suspensions, head bands, sweat bands, and any accessories shall be visually inspected daily for signs of dent, crack, penetration, or any other damage that may reduce the degree of safety originally provided. If damaged, the hard hat and/or its components shall be replaced.

Cleaning shells is dipping them in hot water (approximately 60 ^{o}C) containing detergent for at least one minute. Do not use any oil-based solvent (thinner) for cleaning.

Usually, in accordance with the manufacturer's recommendations, the hard hats are replaced every two years.

11. PROTECTIVE CLOTHING

11.1 General

SUPREME ENERGY shall provide work clothes for each work site employee.

Protective coating give skin protection to arms, body and legs. It can be in forms of uniform (long-sleeves with long pants) or coveralls.

Coveralls provide general skin protection, and are available in a variety of different materials and styles. They may be disposable, breathable, waterproof, fire resistant, or chemical resistant, and may have a hood to protect the head and prevent substances entering via the collar.

Further skin protection is available via the use of gloves and gauntlets where there is a risk of skin contact with harmful materials, sharp objects, or hot/cold surfaces.

Protective clothing will also assist in keeping acidic, corrosive, oily, dirty, or dusty materials off of the body. The type of protection recommended depends upon the nature of the hazard.

11.2 Selection & Use

Site Supervisor shall determine the suitable type of protective clothings base on each working condition.

Synthetic coveralls shall not be worn in hazardous areas (where a flammable atmosphere may be present), due to the risk of ignition from static discharges. Cotton is recommended.

Clothing/Apron - Specific protective clothing shall be used as manufacturer guidance against specific hazard such as: hazardous chemical (minor or major splash), radiant heat, flame, harmful particulate, etc.

Aprons constructed of chemical resistant material (PVC, neoprene) should be worn when handling chemicals (pouring etc.) or washing out containers.

Synthetic clothing and underwear shall not be worn where there is a risk of burning or electrocution, as it will melt onto the skin and cause severe burns. Natural fibers are recommended.

Use of high-visibility vest or working clothes with reflecting light stripe is required when working at environment with low visibility. High-visibility vest is recommended to be used when working near heavy equipment.

11.3 Maintenance

Where coveralls and other protective clothing are provided, they shall be washed on a regular basis to avoid skin infection. Where hazardous substances are present on the clothing, the laundry should be informed of the risk.

12. FOOT AND LEG PROTECTION

12.1 General

Foot protection shall be worn by employees when working in areas where there is a danger of foot injuries from falling and rolling objects, or objects piercing the sole, and where such employee's feet are exposed to electrical hazards. When responding to spills or release of hazardous substances, chemical-resistant footwear should be worn.

12.2 Selection & Use

Safety shoes shall be issued to individuals as appropriate by SUPREME ENERGY Management.

Safety shoes come in a wide variety of styles with numerous protective features. Protective features include steel toes, oil resistant soles, foot guards, and non-spark properties

Boots are preferable to shoes, as they also offer ankle protection. In some industrial situations, there may be caustic or acidic materials on the floor, and so it is necessary to select a sole compound which is resistant to these substances. Otherwise, selection should be based on comfort.

Safety shoes are to meet ANSI Z41.1 specifications or SUPREME ENERGY-approved equivalent. This standard specifies the minimum impact and compression forces the shoe toes may withstand.

Use metal-free non-conductive shoes or boots when work around exposed electrical wires or connections and use rubber safety boots to handle chemical.

Welder shall wear leather leggings during conducting the job.

Personnel working with potential ankle injury risk shall use safety boot (e.g. rigger, gardener, grass cutter, roustabout, welder, carpenter, dustman, sand-blaster).

12.3 Maintenance

Safety footwear should be repaired or replaced once the sole is excessively worn, or if the sole is parting from the upper, or if the protective parts are significantly damaged.

Do not paint safety shoes.

13. HAND PROTECTION

13.1 General

Gloves provide protection against specific chemical agents, temperatures extremes, traumatic injury cuts and act as barriers to protect the skin.

13.2 Selection & Use

Hand protection shall be issued to individuals as appropriate by SUPREME ENERGY Management.

Proper selection of gloves is important. The type of hand protection required depends on the tasks to be performed. Check with a Supervisor on glove suitability to obtain the correct glove for the task, base on the duration, frequency, and degree of exposure to hazards.

Glove shall be fit right to the hand size.

Do not wear gloves while working on moving machinery. (e.g. vertical drill machine, rotary saw machine).

Gloves shall be worn, when handling chemicals, or objects which could cut, splinter the hand.

Gardeners or outdoor workers, who are working in bush area, shall wear leather gloves in addition to minimum PPE in order to protect them from snakebite.

In general the following selections should be made:

- **Leather** - protects hand against splinters, scratches, etc. and should be worn in general manual handling situations, e.g. grass cutting, metal working, welding, grinding, general labor.
- **PVC** - protects against mild corrosives and irritants.
- **Latex -** provides light protection against irritants and limited protection against infectious agents.
- **Natural rubber** - protects against mild corrosive material and electric shock.
- **Neoprene** - for working with solvents, oils or mild corrosive materials.
- **Cloth / Cotton** - absorbs perspiration, keeps objects clean, provides some limited fire retardant properties.
- **Aluminized fabric or other special materials** - for protecting against intense heat.
- **Insulated** – special made up of rubber to protect against electrical shock and burns from high voltage current.

Rubber protective equipment for electrical activities must conform to the requirements established in ANSI as specified in the following list:

Table 5 : Rubber Protective Equipment for Electrical Activities

Item	Standard
Rubber insulating gloves	ASTM D 120-87
Rubber matting for use around electrical apparatus	ASTDM D 178-88 or 178-93
Rubber insulating blankets	ASTM D 1048-93 or 1048-88A
Rubber insulating hoods	ASTM D 1048-88 or 1049-93
Rubber insulating line hose	ASTM D 1050-90
Rubber insulating sleeves	ASTM D 1051-87

13.3 Maintenance

When working with extremely corrosive materials, wear thick gloves. Take the extra precaution in checking for holes, punctures and tears.

Gloves shall be discarded after handling chemical and biological hazards.

Hand washing is required after removal of gloves to ensure no contamination to skin.

Reusable gloves should be cleaned or decontaminated and stored in a clean area.

Oil contaminated gloves should be disposed properly of when use has finished.

14.BARRIER CREAMS

Barrier creams should be applied to hands, in situations where oil, grease etc. will contaminate hands over the working day. The barrier creams prevent this material entering skin pores and makes cleaning of hands at the end of the day easier.

Barrier creams will be provided on an as required basis, for the workshop and maintenance staff at the site.

It should be noted barrier creams provide additional protection against skin irritants and substances which remove natural oils from the skin. Sun screen is a specific form of barrier cream, which reduces the risk of burning and melanoma by filtering the UV component of sunlight.

People with sensitive skins or skin allergies may suffer irritation from certain barrier creams.

Barriers provide very limited skin protection when handling solvents/degreasers, etc. Gloves shall be worn when handling these substances.

15.FALL PROTECTION EQUIPMENT

Fall protection equipment shall be worn when persons are working at heights where falling may cause an injury or fatality.

The standard fall protection equipment is full body harness. Refer to **SE-MSHE-WOR-PRO-0020 Working at Heights** for more details on the types of fall protection equipment; to use and checks to perform before use; and the maintenance of body harnesses and lifelines.

15.1 Selection & Use

Supervisors shall ensure that fall protection equipment shall be worn by personnel whenever there is the possibility of a fall. The following are some examples where the system shall be used:

- When working on elevated positions where a fall hazard exists and there is no physical protection such as handrails.
- When working from ladders while both hands are needed for the work being performed.
- When working from the basket of an articulating boom.
- When workings on open steel, piping, equipment, or while erecting scaffolding or structural steel.
- While working on an elevated surface (e.g. roofs) with a slope greater than 15 degrees where catch platforms are not provided.

- When working at an elevation of 1.8 meters or more where there are no physical protection such as handrails and are at risk of a fall or need both hands free perform their work.

Personnel working at height more than 1.8 meters shall wear full body harness with 2 (two) lanyards for worker's 100% tied off during reposition, life lines, and drop lines (ANSI A10.14 specifications establish performance criteria for the construction and use of this equipment).

Where a lanyard and harness have been subjected to a free fall and therefore been shock loaded, the items shall be used anymore and destroyed.

15.2 Maintenance

All body harnesses and landyards shall be returned after use to the Safety Equipment Store. They will be stored in clean polypropylene or canvas bags. Lines will be coiled to ensure they do not become tangled. The harness will be checked to ensure it has not been contaminated with oil, etc., which could result in the webbing material losing its strength.

All webbing will be checked on a regular basis for wear and tear, stitching failing, fraying, etc. A harness in a poor condition should be replaced.

16.RESPIRATORY PROTECTION

16.1 General

The type of respiratory protection required will be defined in the appropriate Safe Work Practice. The level of protection will be selected based on the type and level of contamination, and the type of work being done.

16.2 Selection

Respiratory protection mask shall have double inhalation valves.

The selection of respiratory protection shall be done by specifically trained HSE personnel. Occupational monitoring will normally be required as part of this selection. Any respiratory devices used by Company staff shall have NIOSH/OSHA/ANSI Z88.2 or similar international standard approval.

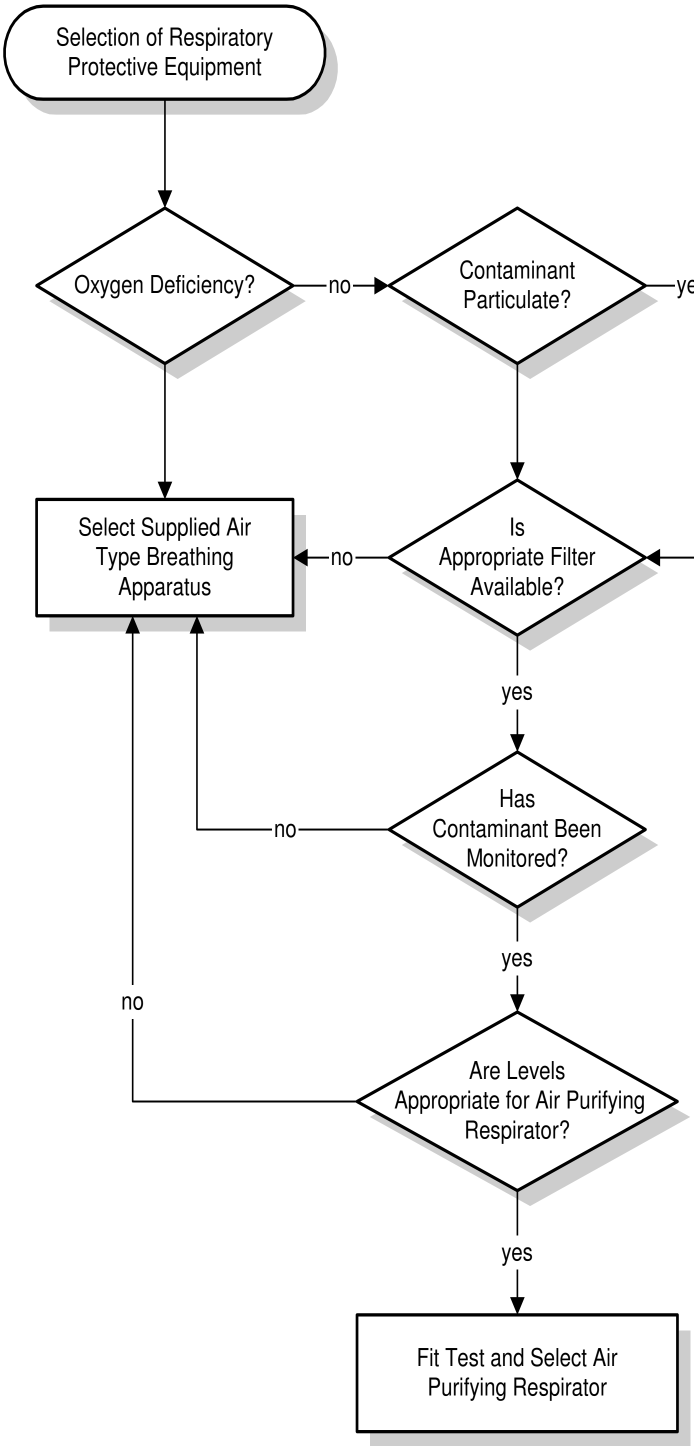
Summaries shall be provided of locations or jobs where airborne contaminant readings are above the exposure limits and shall specify:

- Types of respirators to be used.
- Types of filters, canisters, and cartridges used specifying change frequencies and the basis for change frequencies.
- Evaluation with supervisors and HSE personnel regarding whether hazards can be cost effectively countered with engineering controls.

Air purifying canisters, cartridges and filters used with respirators shall be selected based on the hazard involved (dust, mist, vapors, fumes, gases) and manufacturer recommendation.

A rule for selecting the appropriate type of respiratory protective equipment to use is presented in Figure 2.

Figure 2: Selection of Respiratory Protection Equipment



There are two main types of respirators to be used by SUPREME ENERGY personnel:

i) air purifying double inhalation valves type, and

ii) supplied air.

An air purifying respirator filters the air breathed, either mechanically (in the case of particles) or chemically (e.g. solvents are filtered by absorption onto charcoal or other materials).

Air-purifying respirators can be used only for specific contaminants as specified on the manufacturer canister/cartridge selection criteria and must not be used when there is insufficient oxygen or extremely high levels of contaminants. A summary of type air purifying respirators and what they should be used for is given in Table 6.

Air purifying respirators shall not be used for rescue, emergency work, or in any atmosphere that could be Immediately Dangerous to Life and Health (IDLH).

Note: Potential IDLH means those situations involving operations that may result in a significant release of toxic materials, such as H_2S. This level represents a maximum concentration from which one could escape within 30 minutes without any escape-impairing symptoms or any irreversible health effects.

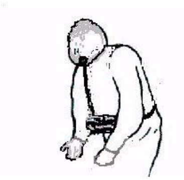
Pressure-demand Self-Contained Breathing Apparatus (SCBA) or Supplied Air-line Breathing Apparatus (SABA) with emergency escape SCBA shall be used during the following conditions:

- work with potential oxygen deficiency.
- confined space entry prior to the atmosphere being certified safe to enter without SCBA/SABA.
- potential exposures to atmospheres IDLH.
- when performing any job where the ambient concentration of H_2S is above 10 ppm or could reasonably be expected to exceed 10 ppm during the course of the work.

Table 6: Respirator Types - Air Purifying

	Name	Type	Use	Limitations
	Dust Mask	Half face disposable dust mask (2 elastic straps)	Protection against nuisance dusts and mist.	Not to be used for toxic dusts or oxygen deficiency. Clean shaven important for good fit.
	Half-face Respirator	Reusable plastic or rubber mask, fitted with disposable cartridges and/or high efficiency filters.	Protection against specific gases, vapors and toxic dusts.	Mask needs to be fitted and maintained. Cartridges need to be replaced. Facial hair not permitted. Not to be used for oxygen deficiency.
	Full-face Respirator	Similar to half-face except that it covers the whole of the face (including eyes).	Similar to half-face. Better seal possible. Also gives eye protection.	Mask needs to fitted and maintained. Cartridges need to be replaced. Not to be used for oxygen deficiency. Should not be used with beards.
	Powered Air-Purifying Respirators (PAPR)	These includes a half or full-face respirator, cartridges and/or filters, a blower and a battery pack to supply air at positive pressure.	Seal is not as important (can be used with beards if contaminant concentrations not greater than 10 times “safe level”). Cooler and more comfortable to use.	Mask needs to fitted and maintained. Cartridges need to be replaced. Not to be used for oxygen deficiency.

Table 7: Respirator Types - Supplied Air

	Air Line, Continuous Flow (SABA)	Supplies air at a constant rate through a hose to respirator or cloak.	Seal not necessary (can be used with beards). Cooler and more comfortable to use. Requires clean air source and air pump.	Mobility restrictions. Not to be used if IDLH (immediately dangerous to life and health) conditions exist, unless escape apparatus also used.
	Self -contained Breathing Apparatus (SCBA)	Supplies air from tank worn by operator to sealed mask.	Can be used in oxygen-deficient atmospheres. Should not be used if facial hair present.	Mobility restrictions. Time limited.
	SCBA - Escape Pack (ELSA)	Supplies air from small tank to hood worn over workers head.	Can be used with facial hair. Can be used in oxygen-deficient atmosphere.	Must only be used for escape purposes. Duration of use: 5 to 8 minutes.

Breathing air may be supplied to respirators from cylinders or breathing air compressor:

a. Cylinders shall be tested and maintained as per manufacturing recommendation.

b. The compressor for supplying air shall be equipped with necessary safety and standby devices. A breathing air type compressor shall be used.

A supplied air respirator provides clean air to the worker. Details of supplied air respirators are given in Table 7.

16.3 Use

Respirators should only be used if the conditions listed below are met:

- The respirator is required in a Safe Work Practice.
- An appropriate and current certificate of competence is held by the wearer.
- The respirator type has been successfully fitted to the individual concerned;
- If a respirator has been fitted on a clean-shaven basis, the respirator is worn on a clean shaven face.
- The respirator will provide sufficient level of protection.
- Respirator is adequately maintained.

16.4 Medical Qualification

Each person using a respirator shall be medically qualified. Assessment shall be made during the physical examination.

No glasses with temple bars including prescription glasses, and contact lenses shall be worn under respirators. Physicians must determine if the worker's visual acuity is sufficient to permit safe emergency escape while using SCBA without glasses.

Respirators will only be issued to persons medically fit to wear them. Personnel who demonstrate any psychological limitations such as claustrophobia or anxiety while wearing a respirator or who are suffering from any physical limitation such as emphysema or asthma or heart disease or anemia or epileptic seizures as determined by medical examination, shall not participate in work that requires the use of respirators.

Note : respirators shall not be issued to any person who has not achieved the appropriate certificate of confidence.

16.5 Fit

All personnel wearing of respiratory protection shall be fit-tested with the appropriate type of respirator. Respirators shall not be issued to any person where a respirator cannot be found to give a good fit.

The fit test will include:

- negative pressure test
- positive pressure test

Personnel should not wear any respirator type for which they have not been specifically fit-tested. Repeat fit testing should be conducted whenever type/size of the respirator is changed.

Personnel shall qualitatively check the fit of their mask before each use. The positive pressure and/or negative pressure fit tests are to be carried out each time an individual puts on a respirator.

Negative Pressure Fit Test

- Place the palms of the hands over the openings in the filter retainer (if so equipped).
- Inhale and hold breath for about five seconds.
- If the face piece collapses slightly and no air leaks between the face piece and the face are detected, a good fit has been obtained.
- If air leaks are detected, reposition the face piece on the face and/or re-adjust the tension of the elastic straps and repeat the negative pressure check until a tight seal is obtained.

Positive Pressure Fit Test

- Hold thumb or palm of hand over outlet of exhalation valve guard.
- Create a slight positive pressure inside face piece by exhaling gently.
- If the face piece bulges slightly and no air leaks between the face piece and face are detected, a tight fit has been obtained.
- If the air leaks out between the face piece and the face, re-adjust the tension of the elastic straps to eliminate the leakage. This check shall be repeated until a tight seal of the face piece is obtained.

Facial features and/or the presence of facial hair may interfere with the fit of respirators, as can the use of spectacles.

Moustaches and stubble growth may spoil the fit of a respirator. Bearded persons cannot expect to achieve adequate respiratory protection when wearing a full-face respirator or a half-face air purifying respirator, accordingly, no one who requires respiratory protection shall attempt to wear either a full-face or half-face air purifying respirator over a beard.

Positive pressure respirators can be worn with a beard. However, with a beard the amount of breathing time an SCBA bottle can provide may be reduced. If necessary, a bearded person may use a continuous flow airline.

It is SUPREME ENERGY policy that personnel who in the course of their regular duties are required to wear a respirator then they shall be clean-shaven. Beards are allowed for those persons who on limited occasions are required to wear respiratory protection.

16.6 Training

Staff required to wear respiratory protection (other than dust masks) on an occasional, regular or emergency basis shall undergo a specific training and fit testing program. Training will be provided by external agencies or by appropriately trained and experienced SUPREME ENERGY personnel.

All staff required to wear respiratory protective equipment on a regular basis shall participate in a Respiratory Protection training program. Following this initial training, staff will be required to participate in an annual refresher course.

New staff must complete the Respiratory Protection training program before carrying out any work that requires the use of respirators. On completion of the course, staff will be issued with a certificate of competence which will be valid for the following year, and will be renewed after they have done their refresher course.

The training shall cover:

- conditions under which Respiratory Protection should be worn
- types of Respiratory Protection
- fit testing
- maintenance.

Management shall keep a record of details of training and persons approved for use of respiratory protection.

16.7 Storage, Cleaning and Maintenance

16.7.1 General

When used regularly, respirators will be issued to individuals (as practicable) for his or her exclusive use. A record of respirator issue and usage should be established and maintained.

Where respirators and supplied air sets are infrequently used, these will be pooled and available for use by any trained individual.

A clean store (Safety Equipment Store), at a convenient part of the site, shall be equipped for the cleaning and storage of respirators. One person shall be responsible for the storage and maintenance of pooled respirators in each area. All persons who issue respirators shall be trained specifically in the issue, selection, upkeep, maintenance and control of safety equipment.

Where a respirator is issued to an individual (air-purifying respirators only), that individual is responsible for its cleaning and use.

When used routinely, respirators shall be cleaned daily. The personnel will be trained in the cleaning of their respirator.

Pooled respirators must be cleaned and disinfected after each use. No device should be issued unless it was cleaned and disinfected after its last use. Prior to re-issue, respirators should be inspected in accordance with the manufacturer's instructions to ensure correct operation of the respirator.

The Safety Equipment Maintainer will ensure that:

- details of all respirator use are recorded.
- exhalation and inhalation valves are checked on return.
- respirators are inspected for defects.
- filters and cartridges are stored correctly.
- filters and cartridges are replaced as appropriate (see below).
- respiratory protective equipment is repaired and replaced of.

16.7.2 Filters and Cartridges

Filters should be stored in sealed containers bearing the date of last inspection. No filters should be stored for longer its expiration date.

When in use, filters should be changed regularly. The following is a guide:

Particulate filters	Change filter when breathing resistance noticeably increases (i.e., the filter pores are clogged).
Gas Respirators	Change filter when odor or taste is perceived by wearer; or when wearer coughs or experiences discomfort; or after a maximum of 4 hours of continuous use.

Note: the length of time for which a filter can be used is dependent on the concentration of the contaminant.

Used filters must be disposed of in an approved manner.

16.7.3 Self-Contained Breathing Apparatus (SCBA)

All SCBA should be maintained and stored in a condition that allows them to be used immediately. Cylinders of compressed oxygen or air shall be fully charged and stored at the recommended working pressure. Only fully charged cylinders shall be issued for use. Partially charged cylinders should be discharged and refilled.

16.7.4 Air Check

Cylinders should be checked on a regular basis to ensure the air is clean and free from contaminants. Checks should be made to ensure the air is not contaminated with hydrocarbons, carbon monoxide and/or carbon dioxide.

Simple on-site checks can be performed by releasing air from a cylinder into a gas tight bag. From the bag, a sample of air can be drawn through a gas detector tube in order to measure for the presence of possible contaminants (CO, NO, and/or CO_2). Additional checks include smell and venting air through a clean cloth.

On a regular basis cylinders should be sent to an approved laboratory for contaminant testing.

As well as testing the cylinders, if a breathing air compressor is used on site to fill air cylinders a weekly inspection should be performed to ensure discharge air is clean and safe to breath.

16.7.5 Straps and Harnesses

SCBA and respirator masks should be stored with all straps and harnesses adjusted to maximum size. On return to the store, the condition of all straps and the operation of all buckles shall be checked.

17.EMERGENCY BREATHING APPARATUS

SCBA that is assigned to emergency use shall be kept solely for this use and is never to be used for normal work related duties.

17.1 Emergency SCBA Sets

Emergency SCBA sets are to be maintained full and ready for use. Straps are to be fully loosened and face mask straps are to be pulled back over the front of the mask ready for immediate use.

Emergency SCBA is to be inspected weekly to ensure bottles are fully charged.

17.2 Emergency Life Support Apparatus (ELSA)

ELSA sets are designed for emergency escape only and are never to be used for any other purpose.

ELSA sets are to be stored in all areas deemed to present a significant fire or gas hazard. They are to be clearly marked and put in easy-to-access locations within each area.

In dusty and outdoor areas they are to be stored in a purpose designed box that has a quick release catch. In other areas they are to be on purpose designed storage shelf.

In addition, ELSAs are to be available to workers, on an as required basis for work that may require emergency escape.

All ELSA sets are to be inspected weekly and on issue. They are always to be maintained fully charged and ready to use.

ATTACHMENT 1: RESPIRATOR FIT-TEST RECORD

(Catatan Uji Kesesuaian Alat Pernafasan)

Site : ………………………………………..

Employee Number	Name	Age	Position	Fit Test Date	Respiratory Size	Remarks

Certified by:

(Competent Tester)

ATTACHMENT 2
STANDARDS CROSS REFERENCE

Safety Glasses

ANSI Z87.1	-	Practice for Occupational and Educational Eye and Face Protection
BS 2092	-	Industrial Eye Protectors
DIN 4642	-	Lenses for Eye Protectors
DIN 58210	-	Protective Goggles
ISO 4849	-	Personal Eye Protector

Hard Hats

ANSI Z89.0	-	Protective Headwear for Industrial Workers
BS 5240	-	Industrial Safety Helmets
DIN 4840	-	Industrial Safety Helmets
ISO 3873	-	Industrial Safety Helmets

Safety Shoes

ANSI Z41	-	Safety - Toe Footwear
BS 1870	-	Safety Footwear
DIN 4843	-	Safety Footwear
ISO 2023	-	Lined Industrial Rubber Footwear

Welding

ANSI/ASC Z49.1	-	Safety in Welding and Cutting
BS 1542	-	Equipment for Eye, Face and Neck Protection Against Non-ionizing Radiation Arising During Welding and Similar Operations
BS 2653	-	Protective Clothing for Welders
DIN 23319	-	Protective Clothing
DIN 51210	-	Face and Eye Protection

Safety Belts and Fall Protection

ANSI A10.14	-	Requirement for Safety Belts, Harnesses, Lanyards, Life Lines and drop Line for Contraction and Industrial Use.
Dupont Eng.	-	S 5 H Safety Belts and Fall Protection Systems Standards.
BS 1397	-	Industrial Safety Belts, Harnesses and Safety Lanyards
DIN 7470	-	Safety Belts
DIN 7474	-	Safety Ropes

Respirators

ANSI Z88.2	-	Practices for Respiratory Protection
BS 2091	-	Respirators for Protection against Harmful Dust, Gases and Scheduled Agricultural Chemicals
BS 4275	-	Recommendation for the Selections, Use and Maintenance of Respiratory Protective Equipment
BS 4667	-	Breathing Apparatus
DIN 3179	-	Respiratory Equipment Classification

DIN 3188	-	Pressurized Breathing Equipment

Hearing Protection

ANSI S3.19	-	Standard Method of the Measurement of Real Ear Protection of Hearing Protectors and Physical Attenuation of Earmuffs
BS 6344	-	Industrial Hearing Protectors
ISO 1999	-	Assessment of Occupational Noise Exposure for Hearing Conversation Purpose.

- Law No. 1/1970 – Safety in the Workplace
- Decree of Minister of Mines and Energy No. 555.K/26/M.PE/1995 - Safety and Health for Mining

supremeenergy	SAFETY, HEALTH & ENVIRONMENT WORK RULES	PROCEDURE
CORPORATE	DRILLING PREPARATION, OPERATIONS AND PRODUCTION TESTING	SE-MSHE-WOR-PRO-0006 Revision: 0

APPROVAL

	POSITION	NAME	SIGNATURE	DATE
Prepared by	SHE Engineer	Erwin Patrisa Floris		
Reviewed By	Sr. SHE Manager	M. Arief Tarunaprawira		
Approved By	VP Relation & SHE	Priyandaru Effendi		**17/05/2013**

REVISION HISTORY

REV	DATE	BY	REVIEWED	APPROVED	DESCRIPTION
0					For Use

TABLE OF CONTENTS

1 INTRODUCTION

1.1 PURPOSE

The safe work practices contained in this section are non-rig specific and therefore some details may not apply. This procedure is to be used as a guide for issue to Contractors and as background information for SUPREME ENERGY (the Company) personnel.

The purpose of this section is to recommend practices and procedures for the promotion and maintenance of safe working conditions for employees engaged in rotary drilling operations and well servicing operations, including special services.

1.2 REFERENCE

API RP 54, *American Petroleum Institute, "Recommended Practices for Occupational Safety for Oil and Gas Well Drilling and Servicing Operations", third edition, August 1999,* is to be read in conjunction with this section of the SUPREME ENERGY Safety, Health, and Environment (SHE) Procedures. All Drilling Contractors working at SUPREME ENERGY sites shall hold a copy of this document.

1.3 SCOPE

This section deals with SUPREME ENERGY safety requirements related to:

- pad or drill site preparation.
- drill rig movement, setting up and tearing down within the SUPREME ENERGY area.
- drilling operations involving a rig and third party services.
- post drilling activities such as production testing and wire line activities.

The requirements also pertain to operations dealing with core, production and injection wells drilled into geothermal reservoirs. The operations at SUPREME ENERGY sites will normally be performed under contractual arrangements.

1.4 GENERAL

The Contractor is responsible for safety at the designated drilling site in accordance with the detailed requirements set out in this section and in the project specific SHE Plan.

- High safety standards in drilling and work-over operations will be achieved:
- using well designed and properly laid out equipment.

- using appropriately trained and qualified personnel.
- where the details of the operations are effectively communicated to all levels of personnel.
- using appropriate drilling industry practices.

1.5 STANDARDS AND DEFINITIONS

Unless otherwise stated, the definitions given in API RP 54: "*Recommended Practices for Occupational Safety for Oil and Gas Well Drilling and Servicing Operations"* shall be applicable. Supervisor is further defined to include the Contractor Tool Pusher and the SUPREME ENERGY Drilling Supervisor or "Company Representative".

Drilling Contractors are to conform with all appropriate API RP 54 recommended practices, and, where applicable, MIGAS regulations: "*Recommended Practices for Safe Conduct of Onshore and Offshore Drilling Operations in Indonesia"* (reference KK-01-DJM), in addition to the requirements of this procedure. Where there is conflict between these documents requirements, the stated higher requirements take precedence.

These standards apply to all activities and all parties associated with drilling operations.

All personnel must be fully trained and qualified for the position and work that they carry out.

It is the responsibility of the Contractor's Supervisor for drilling and service contracts to ensure that all safety standards and procedures are readily available to site personnel and to conduct regular site safety meetings.

1.6 CONTROL OF PLACE OF WORK

When SUPREME ENERGY is in charge of the drilling operation, they are responsible for all safety at the drilling site. The SUPREME ENERGY SHE requirements outlined in this section must be complied with.

When the Contractor is in charge of the drilling operation and in control of the place of work, a safety plan that incorporates the requirements of this section as a minimum must be prepared and submitted to SUPREME ENERGY for approval. In this case, the Contractor is responsible for safety at the designated drilling site and SUPREME ENERGY is no longer directly responsible for the drilling operation.

2 DRILLING SITE PREPARATION

For siting of wells, the effects on existing facilities and operations in terms of safety will be considered by SUPREME ENERGY.

Excavations will be carried out in accordance with the requirements set out in SHE procedure Section : *Excavations and Shoring*. In addition any operations must be adequately illuminated at night.

Sumps or reservoirs which are likely to retain water or sludge to a depth of more than one meter shall be fenced to prevent the unauthorized persons, general public and animals from entering. All sumps shall be signed with warning notices relating to the changing height of the liquid contents in the sump and the possible hydrogen sulphide gas hazard. It is recommended that, as an aid for someone climbing out of a sump, plastic lined sumps shall be installed with knotted ropes or rope ladders at 3 meters centres along the lined slopes. One end of each rope or ladder must be suitably anchored to the ground outside the sump and the other end shall be no greater than 1 meter off the bottom of the sump.

Conductor pipe shall be installed using safe construction techniques. When installed, all conductor pipes shall be completely covered with steel plate or grate tack welded or padlocked to the pipe.

An adequate water supply shall be available to the site during all drilling and work-over operations. The supply shall be adequate for all quenching, drilling (including drilling without returns of circulation) and cementing operations. It shall have adequate redundancy (storage or standby pumps) to ensure water is available at all times and in sufficient quantities to maintain well control and a safe drilling operation.

The well cellar shall be water tight (e.g. concrete) to prevent pollution. The cellar depth shall be minimized and the cellar shall be well ventilated. Cellars shall be designed and constructed to incorporate a fast and easy means of egress from the cellar floor, both when the rig is operating and following rig removal. Ladders are not acceptable as the sole means of egress. Cellars shall be adequately drained.

3 WELL DRILLING AND SERVICES OPERATIONS

3.1 GENERAL

The Contractor will be required to develop, implement and monitor safety program that shall meet or surpass all applicable industry, government and SUPREME ENERGY (outlined in this procedure) standards which include:

- instruction of the Driller or Crew Chief of his/her responsibility for the safety of drilling crews under normal operating and emergency conditions.
- sufficient training of new employees, regardless of prior experience, to the stage that the employee can fill the assigned position in a safe manner.
- instruction of crew members in safe work procedures and practices.
- weekly safety meetings attended by all personnel where crew safety education, hazard identification, problems of the job relating to safety, and related safe practices are discussed.
- good housekeeping practices.
- availability and use of personal protective clothing and equipment.
- contingency and emergency plans suitable for the operation.

Records of safety meeting attendance and topics discussed are to be kept.

A detailed safety inspection of the operation shall be carried out on a monthly basis and a copy of the inspection record (refer to the safety audit checklist for on-shore rigs - at the back of this section). This inspection will be carried out on the first work day of each month. A copy is to be kept on the site file and a copy sent to SUPREME ENERGY.

Contractor shall report their HSE activities to SUPREME ENERGY not later than the 5th day of the month following.

3.2 INJURIES AND FIRST AID

The Drilling Contractor shall follow first aid procedures the same as, or similar to, SUPREME ENERGY procedures as described in SHE procedure Section …: *First Aid and Medical*.

The SUPREME ENERGY incident and accident reporting procedures outlined in HSE procedure Section …: *Accident and Incident Reporting* are to be followed at all times.

3.3 EMERGENCY PREPAREDNESS

Emergency drills are to be carried out weekly by all personnel. Topics covered may include, but not limited to, procedures for evacuation and abandonment, H_2S evacuation, firefighting, site stability, well control, kick detection and control and spill response.

3.4 PERSONNEL SAFETY

3.4.1 General

Employees shall wear personal protective clothing and use personal protective equipment (PPE) when working in hazardous environments where injury, illness, or death can be prevented by the use of such equipment. SUPREME ENERGY requirements in the use and wearing of safety clothing and equipment are discussed in SHE procedure Section …: *Personal Protective Equipment (PPE)* and the requirements of API RP 54 shall be complied with.

3.4.2 Personal Safety Protection and Clothing

- Head protection (safety helmets) shall be worn in all designated hard hat areas.
- Eye protection shall be worn where there is danger of injury to the eyes from flying objects, chemicals, or injurious light or heat rays, etc.

- Safety shoes or boots with toe protection shall be worn. Hot fluids may be inadvertently discharged onto the rig floor or in the vicinity of the rig floor. Footwear with open tops can collect hot fluids during such discharges. Personnel shall ensure that open tops are laced closed or that PVC over trousers lap over the top of the open footwear.
- Protective gloves, aprons, and face visors shall be worn by personnel handling chemicals. Additional PPE (such as respirators) may be required. Refer to the Material Safety Data Sheet (MSDS).
- Loose or poorly fitting clothing, jewelry and other adornments that may catch or snag must not be worn.
- Long hair shall be contained to prevent entanglement.
- Hearing protection shall be worn in high noise areas.
- Respiratory protective equipment shall be worn in any situation where the presence of harmful gases etc, are suspected or known to be present.

3.4.3 Safety Equipment and Procedures

All personnel shall obtain permission from the Tool Pusher before going onto the drill floor.

Safety belts with an attached lanyard shall be worn by Derrickmen when handling pipe or casing above derrick floor. A safety harness shall be worn by all personnel when working or climbing aloft.

All equipment shall be maintained in proper working order. Any failure or break-down of equipment shall be reported immediately to the Driller on shift, or to the Tool Pusher.

3.5 VISITOR CONTROL

All visitors shall report to the site office upon arrival at site.

3.6 SMOKING

Smoking shall be prohibited at or in the vicinity of operations that constitute a fire hazards. Such locations should be conspicuously posted with a sign, “NO SMOKING OR OPEN FLAME”, or equivalent.

Smoking shall be permitted only in areas designated for smoking i.e. outside well pad perimeter fence.

3.7 HOUSEKEEPING

SUPREME ENERGY safety regulations with respect to housekeeping as outlined in SHE procedure Section …: *Housekeeping* are to be followed. Refer also to Section 6.5 of API RP 54.

Work areas shall be maintained clean and free of debris and tripping hazards.

Adequate means should be provided to convey any hazardous substances away from the rig floor while pulling wet strings of pipe.

Leaks or spill shall be promptly cleaned up to eliminate personnel slipping, fire hazards, and environmental pollution.

If personnel are required to work in a cellar, it should be kept reasonably clear of water, oil, or drilling fluid accumulation. No loose equipment or materials should be in the cellar except equipment or materials in use or about to be used. Personnel are to take appropriate precautions for the presence of hydrogen sulphide gas as outlined in HSE procedure Section …: *Hydrogen Sulphide*, when working in, or entering, cellars.

When placing equipment and tools around the rig floor and drilling location, care should be taken to leave egress routes open.

Tools and equipment should be securely placed and stored in a position or manner so they will not fall.

3.8 FLAMMABLE AND HAZARDOUS LIQUIDS HANDLING AND STORAGE

For details on the SUPREME ENERGY SHE procedure in the handling, signage and storage of hazardous substances such as fuel and chemicals etc., refer to Section …*: Hazardous Substances*. Refer also to Sections 8 and 6.13 of API RP 54

3.9 FIRE PREVENTION AND PROTECTION

For details on the SUPREME ENERGY SHE procedures in fire prevention and protection, refer to Section …: *Fire Prevention and Fire Fighting Equipment*. Fire prevention and protection is also discussed in Section 7 of API RP 54.
Safe storage and location of combustible and flammable materials and the prevention of accumulation of rubbish are important for fire prevention.

Potential sources of ignition should be permitted only in designated areas at a safe distance from the well head or flammable liquid storage areas.

Fire extinguishers and other fire fighting equipment shall be suitable located, readily accessible, free of obstruction, and plainly labeled as to their type and method of operation.

Crew members shall be familiarized with the location of fire control equipment and selected personnel shall be trained in the use of such equipment.

3.10 PERSONNEL QUALIFICATION

All drilling personnel shall be fully trained and qualified for the position and work that they carry out.

All training shall include, but not be limited to, the following:

- well control and blow-out preventions.
- firefighting requirements and procedures.
- first aid procedures.
- rig and equipment operations.
- personnel protective equipment.
- emergency and evacuation procedures.
- understanding the health effects of carbon dioxide (CO_2) and hydrogen sulphide (H_2S).

3.11 PERMITS-TO-WORK

The Contractor is to use a permit-to-work system that is the same or similar to the SUPREME ENERGY Work Permit System. For details refer to Section…: *Permit to Work System* and Section...: *Hot Work.*

3.12 WARNINGS AND OTHER NOTICES.

Warning notices shall be prominently displayed indicating restriction, safety equipment and first aid station. They shall be written in both Bahasa Indonesian and the English language.

Safe briefing areas (muster stations) are to be established at suitable locations, signed accordingly, and indicated with a green flag.

Information board may be used to display other notices such as, but not limited to, emergency numbers, lesson learn articles, safety committee messages and safety campaign materials.

3.13 MACHINERIES AND TOOLS

SUPREME ENERGY SHE procedure for machineries and tools outlined in Section …: *Plant, Systems and Equipment* and Section …: *Safety with Hand Tools and Portable Equipment* are to be followed. Refer also to Section 9 of API RP 54 for drilling and well-servicing equipment.

Machinery shall be operated only when authorized to do so by the Supervisor.

3.14 VEHICLES

Vehicles not involved in the immediate rig operations should be located a minimum distance of 30 meter from the well bore.

It is preferred that during a drilling operation, vehicles are parked outside the well pad fenced area.

Vehicle parking shall be backward.

3.15 EXPLOSIVES

SUPREME ENERGY SHE procedure on the storage, handling and use of explosives as laid down in Section …: *Hazardous Substances* and the MIGAS publication "*Recommended Practices for Safe Conduct of Explosive Handling in Indonesia" are to be followed.*

3.16 WELDING AND FLAME CUTTING

Procedures the same as, or similar to, SUPREME ENERGY procedures for welding and flame cutting outlined in Section …: *Hot Work*; are to be followed whenever any such work is to be undertaken.

Field welding shall not be carried out on tongs, elevators, bails or heat-treated rig equipment.

3.17 MSDS (MATERIAL SAFETY DATA SHEET)

Material safety data sheets shall be provided for all potentially hazardous materials supplied on-site.

4 DRILLING EQUIPMENT AND OPERATIONS

4.1 EQUIPMENT SAFETY

Inspection and testing of equipment is an important factor for the safety of personnel, especially equipment that must be operated when emergencies occur. All equipment shall be regularly inspected and maintained to a high standard. All inspections and tests shall be duly recorded.

4.2 OPERATIONAL SAFETY

The erection and lay down of derricks and masts should be performed only during day light hours. Otherwise, appropriate strict limitation and precautions shall be established for conducting such activities during night time.

All equipment and materials used on site shall be manufactured, designed, marked to a recognized standard, and certified "safe for use" by an appropriately qualified person.

Prior to any structure being constructed, a foundation analysis shall be performed by an appropriately qualified person and certified "safe for construction". In addition, the foundation shall be inspected after heavy rains or occurrences that could adversely affect the safety of the structure.

Temporary structures shall be thoroughly inspected during and after erection and weekly thereafter.

Non-destructive test (NDT) inspections are required on selected equipment. The Contractor shall list out the equipment that requires NDT testing and supply the appropriate certificates showing test compliance.

A valid Worthiness certificate (SILO) shall be obtained from Directorate General Energi Baru Terbarukan dan Konservasi Energi (Dirjen EBTKE).

4.3 PRELIMINARY RIG UP OPERATIONS (REFER ALSO TO SECTION 6.3 OF API RP 54)

Prior to commencing rig-up operations, the planned arrangement of all equipment to be placed on the location should be reviewed to eliminate potentially hazardous condition.

Drilling operations shall not be commenced until the rig is rigged in a safe manner.
The rig substructure or derrick mast should be grounded to prevent build-up of static electricity.

Amenity buildings must not be located in the vicinity of rig fuel tanks.

Prior to initiating well servicing operations, the well shall be checked for pressure. Appropriate steps should be taken to remove pressure, or to operate safely under pressure, before commencing operations.

4.4 DERRICKS AND MASTS

The regulations outlined in the Section 9.2 of API RP 54 shall be followed in addition to the requirements set out below.

4.4.1 Erection

All nuts and bolts should initially be tightened to a low torque until the entire structure is completely erected, at which time the bolts and nuts should all be tightened to the correct torque specified by the manufacturer.

All leg sections shall be straight as bent sections have reduced strength and place undue stress on other sections by pulling them out of line.

All erection equipment such as winches, gin poles etc. shall be regularly inspected with records kept of the inspections and shall be used only within their safe working loads.

No other work shall be carried out under the derrick while it is being erected or dismantled or under the mast while it is being raised or lowered. Cellar shall be completely covered during these operations.

4.4.2 Derrick Alignment

Eccentric loading of a derrick should be avoided. Due to unequal settling of the derrick corners the center of the water table may not line up with the center of the well. This situation should be rectified by shimming the corners, never by moving the crown block.

4.5 LADDERS, STAIRWAYS, AND PLATFORMS

The regulations outlined in the Section 9.3 of API RP 54 shall be followed.

4.6 DRAWWORKS

The regulations outlined in Section 9.4 of API RP 54 shall be followed.

4.7 CATHEADS AND LINES POWERED BY THE CATHEAD

The regulations outlined in Section 9.5 of API RP 54 shall be followed.

4.8 HOISTING LINES AND OTHER WIRE ROPE

The regulations outlined in Section 9.6 of API RP 54 shall be followed.

4.9 HOISTING TOOLS, SUCH AS HOOKS, BAILS, ELEVATORS, AND OTHER RELATED EQUIPMENT

The regulations outlined Section 9.7 of API RP 54 shall be followed.

4.10 ROTARY TABLE

The regulations outlined in Section 9.8 of API RP 54 shall be followed.

4.11 DRILL PIPE SLIPS AND TONGS

The regulations outlined in Section 9.9 of API RP 54 shall be followed.

4.12 WEIGHT INDICATORS

The regulations outlined in Section 9.10 of API RP 54 shall be followed.

4.13 DRILLING FLUID TANKS

The regulations outlined in Section 9.11 of API RP 54 shall be followed.

4.14 PIPE RACKS

The regulations outlined in Section 9.12 of API RP 54 shall be followed.

4.15 PRESSURE EQUIPMENT

The regulations outlined in Section 9.13 of API RP 54 shall be followed.

4.16 GENERATORS, MOTORS, AND LIGHTING

The regulations outlined in Section 9.14 of API RP 54 shall be followed.

4.17 INTERNAL COMBUSTION ENGINES

The regulations outlined in Section 9.15 of API RP 54 shall be followed.

4.18 ELECTRICAL SYSTEMS EQUIPMENT

The regulations outlined in Section 10.2 of API RP 54 shall be followed.

4.19 WORK IN PROXIMITY TO EXPOSED ENERGIZED POWER SOURCES

The regulations outlined in Section 10.1 of API RP 54 shall be followed.

4.20 LAND RIG MOVE

A detailed rig move plan shall be prepared and submitted to SUPREME ENERGY for approval at a reasonable pre-determined time prior to rig move or mobilization. The plan should include full details on route control, equipment size and weight, location, hazardous loads and police escort. In addition, a contingency plan on the above must be prepared.

4.21 WELLHEAD OPERATIONS

In all instances, the design working pressure of the wellhead assembly shall not be less than the maximum reservoir pressure at operating conditions.

Removal and/or installation of the wellhead assembly shall be carried out with the required safety equipment in operation or ready for immediate use. When wellhead assemblies are removed, where practically, they shall be broken down, inspected, re-assembled and tested before being re-installed. Following installation, all working components of the assembly shall be operated and pressure tested before removing tubing plugs and opening of surface and subsurface safety equipment.

Before making any minor adjustments to the wellhead assembly, such as gauge changes, the operator will first close all necessary wellheads, flow lines or any other valves which could be a potential pressure source and shall ensure that all pressure is bled off.

4.22 RIDING HOISTING EQUIPMENT

The requirements of Section 6.11 of API RP 54 must be followed.

Personnel may not ride the elevators or catline except in emergency situations or in extreme climatic conditions where, with the appropriate fall protection equipment, it may be safer than ascending or descending the derrick ladders.

The elevators shall be empty of pipe and other equipment while personnel are riding the elevators.

4.23 RACKING PIPES AND DRILL COLLARS

The requirements of Section 6.12 of API RP 54 shall be followed.

Pipe and drill collars racked in the derrick shall be secured to prevent them from falling across the derrick or mast and precautions taken to prevent them from accidentally rolling across the storage rack.
Safety clamps used on drill collars, flush-joint pipe, or similar equipment (to prevent them falling into the well when not held by the elevators) must be removed before hoisting continues.

4.24 BLOW-OUT PREVENTION EQUIPMENT (BOP)

The requirements of Section 6.4 of API RP 54 shall be followed.

i. All necessary precautions shall be taken to keep all wells under control at all times. The following general procedures shall be followed, unless waived or amended by SUPREME ENERGY.

- Blow-out preventers and related well control equipment shall be installed and tested immediately after installation and then at weekly intervals, and be maintained ready for use until drilling operations are completed.
- Temperature-sensitive components such as packing elements and ram rubbers shall be made of material(s) that will resist as high a temperature as necessary.
- All kill lines, blowdown lines, manifolds and fittings shall be constructed of steel or iron and shall under all circumstances have a minimum working pressure and temperature rating exceeding the maximum anticipated surface pressure and temperature.
- Subject to (ii) and (iii) of this Section, blow-out prevention equipment shall have procedurally-operated position selectors and hydraulic actuating systems with accumulators of sufficient capacity to close all of the hydraulically-operated equipment.
- Dual control stations shall be installed with a high-pressure backup system. One control panel shall be located at the driller's station and one control panel shall be located on the ground, at least 15m away from the wellhead or rotary table.
- Air or other gaseous fluid drilling systems shall have blow-out prevention assemblies. Assemblies may include, but are not limited to, a rotating head, a double ram blow-out preventer or equivalent, or a blind ram blow-out preventer or gate valve.

ii. A proposed blow-out prevention program and blow-out contingency plan must be submitted to SUPREME ENERGY by the Rig Contractor and meet the minimum requirements listed below.

- Before drilling below the conductor casing string, at least one remotely controlled annular preventer and flow diverter system shall be installed. The annular preventer must permit the diversion of geothermal and other fluids.
- Before drilling below the surface, intermediate or production casings, the blow-out prevention equipment installed must include a minimum of:
  - one expansion-type preventer and accumulator or rotating head.
  - both procedure and remote-controlled hydraulically-operated double ram blow-out preventer, or acceptable alternative having a minimum working pressure and temperature rating exceeding maximum anticipated surface pressure and temperature.
  - a drilling spool with side outlets, or equivalent.
  - a fill-up line.
  - a kill line equipped with at least one valve rated for high temperature conditions.
  - a blow down or choke line equipped with at least two valves rated for high temperature conditions and securely anchored at all bends and at the end.

iii. Blow-out equipment shall be tested or inspected in accordance with the following provisions and the results recorded in the drilling log:

- Ram-type blow-out preventers and auxiliary equipment shall be tested to a minimum of 1,000 psig (70 barg) or to the working pressure of the casing or assembly, whichever is less. Expansion-type blow-out preventers must be tested to 70 percent of the above pressure testing requirements.
- The blow-out prevention equipment shall be pressure tested:
  - when installed.
  - before drilling out plugs and casing shoes.
  - not less than once each week, alternating the control stations.
  - following repairs that require disconnecting a pressure seal in the assembly.
- During drilling operations, blow-out prevention equipment shall be actuated to test proper functioning as follows:
  - once each trip for blind and pipe rams but not less than once each day for pipe rams.
  - at least once each week on the drill pipe for expansion-type preventers.
- All flange bolts shall be inspected at least weekly and tightened as necessary during drilling operations.
- The auxiliary control systems shall be inspected daily to check their mechanical condition and effectiveness.
- Blow-out prevention and auxiliary control equipment shall be cleaned, inspected and, if necessary, repaired before installation.

iv. Blow-out prevention controls shall be plainly labeled. All crew members shall be instructed on the function and operation of this equipment.

v. A blow-out prevention drill shall be conducted weekly for each drilling crew.

vi. A drill string safety valve in the open position shall be maintained on the rig floor at all times while drilling operations are being conducted. A kelly cock shall be installed between the kelly and the swivel.

vii. The properties, use and testing of drilling fluids and related drilling procedures shall be adequate to prevent the blow-out of any well. Sufficient drilling fluid materials to ensure well control shall be maintained in the field area and be readily accessible for use at all times. Control and testing procedures are listed below.

- Before pulling the drill pipe, the drilling fluid shall be properly conditioned or displaced. The hole shall be kept reasonably full at all times. The annular mud level should not be deeper than 30 meters from the rotary table when coming out of the hole with drill pipe. Mud cooling techniques shall be utilized when necessary to maintain mud characteristics for proper well control and hole conditioning.

- Mud testing and treatment consistent with good operating practice shall be performed daily or more frequently as conditions warrant. Mud testing equipment shall be maintained on the drilling rig at all times.

- The following drilling fluid system equipment shall be installed and operated continuously during drilling operations:

  - high-low level mud pit indicator including a visual and audio-warning device.
  - degassers, desilters, and desanders, or acceptable alternatives
  - a mechanical, electrical, or procedure surface drilling fluid temperature monitoring device. The temperature of the drilling fluid going into, and coming out of, the hole shall be monitored, read and recorded on the drilling log for a minimum of every 3 meters of hole drilled below the conductor casing.
  - a Hydrogen Sulphide (H_2S) indicator and alarm shall be installed in areas suspected or known to contain Hydrogen Sulphide (H_2S) gas which may reach levels considered to be dangerous to the health and safety of personnel in the area.
  - a reliable and adequate water supply and rig site water storage shall be maintained at all times when drilling below the surface casing. The suction of each mud pump shall allow for the immediate switching to the rig site water storage when required.

viii. Unless the well is secured with blow-out preventers or cement plugs, a member of the drilling crew or the Toolpusher shall monitor the rig floor from the time drilling operations are initiated through until the well is completed or abandoned.

iv. No exceptions to the requirements of this Section are allowed without the specific prior approval of SUPREME ENERGY.

Note that Items i to iii above are not normally necessary for work overs.

4.25 ACIDIZING, FRACTURING, AND HOT OIL OPERATIONS

The regulations outlined in Section 16 of API RP 54 shall be followed.

4.26 CEMENTING OPERATIONS

The regulations outlined in Section 17 of API RP 54 shall be followed.

4.27 GAS, AIR, OR MIST DRILLING OPERATIONS

The regulations outlined in Section 18 of API RP 54 shall be followed.

4.28 WIRE LINE WORK

The regulations outlined in Section 13.7 of API RP 54 shall be followed.

4.28.1 General

All wire line equipment to be manufactured or fabricated shall be designed and built to appropriate standards and to withstand the anticipated temperatures, pressures and loads with adequate safety margins.

4.28.2 Placement and Handling of Wire line Service Units

The regulations outlined in the relevant section of API RP 54 shall be followed.

4.28.3 Gin Poles (Telescoping and Single Poles)

The regulations outlined in relevant section of API RP 54 shall be followed.

4.28.4 Rope Falls (Block and Tackle)

The regulations outlined in the relevant section of API RP 54 shall be followed.

4.28.5 Wellheads, Wellhead Connections, and Adaptors

The regulations outlined in the relevant section of API RP 54 shall be followed.

4.28.6 Lubricators and Wire Line Blow-Out Preventer Equipment

The regulations outlined in the relevant section of API RP 54 shall be followed.

4.28.7 Wire Line Operations

The regulations outlined in the relevant section of API RP 54 shall be followed.

4.28.8 Perforating (if applicable)

The regulations outlined in the relevant section of API RP 54 shall be followed in addition to the following requirement.

- During wellbore operations, any work requiring the use of explosives (perforating guns, line cutters, etc.) shall be carried out according to SUPREME ENERGY SHE procedure outlined in Section …: *Hazardous Substances*.

4.28.9 Auxiliary Escape

The regulations outlined in Section 6.10 of API RP 54 shall be followed.

On all rigs, prior to personnel working on the derrick, the derrick or mast shall have an auxiliary means of escape from the derrickman's platform installed. Except in an emergency, personnel shall not ride the safety buggy, escape equipment or slide down stands of drill pipe, stands of drill collars, or the deadline to get down the derrick or mast substructure.

Auxiliary escape devices shall be tested after installation to confirm that they are operating correctly.

4.29 HYDROGEN SULPHIDE (H_2S) AND DRILLING

SUPREME ENERGY SHE procedure outlined in Section ...: *Hydrogen Sulphide* are to be complied with.

a) A contingency plan shall be developed when hydrogen sulphide (H_2S) is expected during well operations. The contingency plan should include:

- H_2S monitoring plan.
- pre-alarm conditions.
- designation at briefing areas.
- evacuation plan and notification of authorities.
- a list of medical facilities and contact details.
- personnel to be fully trained.
- procedures for the evacuation of surrounding public areas.

b) Drilling and associated equipment selected for wells where H_2S may be encountered, shall be designed and constructed to comply with recognized standards and specifications.

c) All personnel whose presence is required on a drilling operation where H_2S is anticipated, shall be properly trained and shall have the necessary equipment to prevent exposure to the hazard that can cause serious injury.

4.30 DANGEROUS AREA

The area around the drilling rig is considered a "Hazardous Area". Hazardous Area Classification is required to ensure that the area has special precautions developed for control. No unauthorized personnel shall enter the area.

While the installation is under drilling or workover conditions, the following special precautions apply:

i. The standard wellhead pressure test, applicable to the work in hand, shall be repeated every 7 (seven) days.

ii. Warning signs shall be placed around the site and no unauthorized personnel should be permitted in it. Specific site areas may be designated as "NO SMOKING" areas and "NO SMOKING" signs shall be displayed in these areas.

iii) Welding and cutting will be permitted only on issue of a Hot Work Permit (refer to Section …: *Permit to Work System and Section...: Hot Work*).

4.31 ABANDONMENT OF WELLS

Abandonment of a well operation shall not commence without prior approval from SUPREME ENERGY and shall be carried out in accordance with standard industry procedures. A report of abandonment shall be submitted by the drilling contractor within 30 days from completion of the work and shall include the following:

- notice of intent to abandon well.
- subsequent report of abandonment.
- procedures for permanent abandonment.
- procedures for temporary abandonment.

Installation of the plug shall, where possible, result in the isolation of any potential source of fluid migration from one zone to another within the well bore due to formation pressure differentials. Installation of plugs shall ensure isolation of the well casings from formation pressure.

5 POST DRILLING OPERATIONS

5.1 PRODUCTION TESTING

Production testing should commence only if the following conditions are met:

- all test facilities have been fully pressure tested and checked.

- H_2S and abandon location drills have been held.
- lock-out procedure for well/pipeline has been completed as required.

5.2 WELL TESTING AND MONITORING

This section deals with the well, after the rig operations have ended, and when it is either left unattended, monitored or tested.

- All valves on a well head shall have their valve wheels or handles removed or locked when the well is unattended. Removed wheels or keys to padlocks shall be left in the care and responsibility of the SUPREME ENERGY authorized personnel.
- Only experienced personnel shall be allowed near the wells and to operate the valves.
- Warning signs indicating the appropriate hazard shall be erected at each well and adjacent to any pipework leading from the well or equipment attached to the well. If the equipment or pipe is un-insulated the warning signs shall indicate a hot pipe hazard.
- When discharging any well, including bleeding, the primary or master valve shall not be used to control the flow. A second valve shall be installed adjacent to the primary or master valve and used to control the flow rate.
- All valves, flanges, spools, tees, elbows and pipework shall be rated for the anticipated temperature and pressure conditions.
- Bleed lines shall be terminated at some distance from the well head to avoid the concentration of hazardous gases in the cellar or in other low lying areas.
- Installation of output test equipment shall be done in a safe manner.
- Where suction can be developed at the open annulus between two concentric pipes (e.g. when a discharge is through a smaller pipe into the larger entry pipe of an atmospheric separator or silencer), then the opening should be covered to prevent material or personnel being pulled into or against the open annulus.
- During well discharges, personnel shall wear safety helmets, safety boots and ear protection when working within 30 meters of any equipment. Wire line work shall be carried in accordance with the relevant clauses in Section 8.4.28 of this procedure.
- Where possible, prior to discharge testing, the well's casing should be allowed to heat-up by bleeding the well through a dedicated bleed line.
- Prior to injection testing, wells are to be quenched as per standard industry practice.

- Good industry practice is to be used during all testing operations to ensure the well casing is not damaged. Such damage could lead to safety implications.

6 SAFETY AUDIT CHECKLIST

A “Safety Audit Checklist” shall be completed at the beginning of drilling work or as deemed appropriate by SUPREME ENERGY.

A copy of this checklist can be found in the publication MIGAS publication “*Recommended Practices for Safe Conduct of On-shore and Off-shore Drilling Operations in Indonesia (Reference KK-01-DJM), Appendix B - Safety Audit Checklist for Land Rig (Lampiran B - Daftar Pemeriksaan Audit Keselamatan Untuk Instalasi Pemboran Darat)”*. For convenience, the “Safety Audit Checklist” is reproduced at the end of this section. The reader should refer back to the original checklist contained in the said Recommended Practices, to ensure the checklist is up to date.

Other safety forms required with respect to drilling safety are listed in the attachments.

7 APPENDIX

7.1 APPENDIX 1 SAFETY INSPECTION OF ONSHORE DRILLING RIG

SAFETY INSPECTION OF ONSHORE DRILLING RIG
DEPARTMENT OF MINES AND ENERGY REPUBLIC OF INDONESIA
DIRECTORATE GENERAL OF RENEWABLE ENERGY AND ENERGY CONSERVATION

COMPANY : .... **LOCATION : ....**
WORK DESCRIPTION : .... **WELL : ....**
DRILLING RIG : .... **DATE : ....**

A . DOCUMENT INSPECTION

1 .Drilling program discussion :…………………………………………………………………(date/place)
2. K3L Management System : available / not available
3. Drilling installation worthiness certificate No :…………………………………….
Issued by :…………………………………….
Validity :……………………………………. .
4. Contingency and Emergency Response Plan : available / not available
5. Measurement instruments calibration document : available / not available
6. UKL/UPL document :available / not available
7. Maintenance Log Book of Rig :available / not available : available / not available
8. Periodic inspection report of Rig equipment : available / not available
9. Crew competency certification : available / not available : available / not available
10. Standard Operation Procedures : available / not available : available / not available

B. VISUAL INSPECTION

1. Condition of drilling safety area (>70 M) : good/not good
2. Warning signs : sufficient/not sufficient
3. Emergency access : sufficient/not sufficient ; good/not good
4. Muster point for emergency situation : available / not available (state how many)
5. Equipment marking : good/not good

C . GENERAL

1. Location condition : good/not good
2. Signboard/well name : available/not available
3. Sign board
   a. No Smoking : available/not available
   b. No Entrance : available/not available
   c. Well condition : good/not good
   d. T-card : available/not available
   e. Display board : available/not available
4. Safety signboard
   a. Safety helmet : available/not available
   b. Safety shoes : available/not available
   c. Mask : available/not available
   d. Safety belt : available/not available
5. House keeping and Cleanliness
   a. Doghouse : good/not good
   b. Engine area : good/not good
   c. Tool house : good/not good
   d. Pump area : good/not good
   e. Mud tank area : good/not good
   f. Work shop : good/not good
   g. Rig floor : good/not good
6. Communication System
   a. Radio : available/not available
   b. Telephone : available/not available
   c. Intercom : available/not available
   d. Hand Phone : available/not available
   e. Public address : available/not available
7. Wind sock : available/not available
8. Welding equipment
   a. Positive connector : available/not available
   b. Negative wire : available/not available
   c. Welding torch : available/not available
   d. Tong : available/not available
   e. Terminal box : available/not available
   f. LPG bottle : available/not available
   g. Oxygen bottle : available/not available
   h. Acetylene bottle : available/not available
   i. Hose condition : available/not available
   j. Gas bottle rack LPG/ Acetylene/Oxygen : available/not available
9. Explosive storage : available/not available
10. Employees

a.National :…………….......persons
b.Expatriate :...................persons
11. Chemical storage : available/not available
12. Survey meter : available/not available

D. INSTALLATION

1. Rig foundation : available/not available
2. Rig floor : available/not available
3. Rig substructure : available/not available
4 Fences : available/not available
5 Ladders : available/not available
6. Mast ladder : available/not available
7 Locking pin : available/not available
8. Deck : available/not available
9 Gin pole : available/not available
10 .Monkey board : available/not available
11. Crown block : available/not available
12. Traveling board : available/not available
13. Stubbing (st) board : available/not available
14. Stopper (st) board : available/not available
15. Guy wire : available/not available
16. Moon line : available/not available
17. Drilling wire : available/not available
18. Rotary hook : available/not available
19. Swivel : available/not available
20. Kelly stop cock : available/not available
21. Rotary hose : available/not available
22. Rotary table: available/not available
23. Elevator & Spider : available/not available
24. Kelly bushing : available/not available
25. Elevator links : available/not available
26. Pipe slips : available/not available
27. Spinning wrench : available/not available
28. Safety clamps : available/not available
29. Rotary tong & Power tong/spin master : available/not available
30. Lift nipples/cup : available/not available
31. Rat hole system : available/not available
32. Steel hammer : available/not available
33. Copper/fiber glass hammer : available/not available
34. Pipe bridge : available/not available
35. Pipe wrenches : available/not available
36. Toe board at rig floor : available/not available
37.Wrenches
   a. Pipe wrenches : available/not available
   b. Chain wrenches : available/not available
   c. Open ended wrenches : available/not available
   d. Ring wrenches : available/not available
38.Chain on Stand pipe & Swivel: available/not available
39. Blow Out Preventer
   a. Annular : available/not available
   b. Pipe rams : available/not available
   c. Blind rams : available/not available
   d. Wellhead connector: available/not available
   e. Flow line : available/not available
   f. Killing line valve : available/not available
   g. Choke line valve : available/not available
   h. Accumulator unit : available/not available
   i. Last test date : ……………….(dd/mm/yy)
   j. Hydrill annular : available/not available

E. SAFETY EQUIPMENT

1. Escape line : available/not available
2. Escape line anchor : available/not available
3. Escape chair : available/not available
4. Climbing belt : available/not available
5. Safety line on counter weight : available/not available
6. Safety helmet : available/not available
7. Safety shoes : available/not available
8. Safety belt : available/not available
9. Gloves
   a. Leather : available/not available
   b. Rubber : available/not available
   c. Cotton : available/not available
   d. Heat resistant : available/not available
10. Gas Mask at monkey board : available/not available
11. Spare Gas Mask : available/not available
12. Spare of gas canister : available/not available
13. Dust mask : available/not available
14. Air bank : available/not available
15. Gas Detector for H_2S and other toxic gases : available/not available
16. Dust goggles : available/not available
17. Welding goggles : available/not available
18. Stretcher : available/not available
19. Apron : available/not available
20. Ear protector : available/not available
21. Coverall/work clothes: available/not available
22. Fire axes : available/not available
23. Fire blanket : available/not available
24. Fire suits : available/not available
25. Breathing apparatus
   a.SCBA 45 minutes : ………………………unit
   b.EEBA 10 minutes : ………………………unit
   c.5 minutes work unit : ………………………unit
26. Body harness : ………………………unit
27. Eye wash : ………………………unit
28. Shower : ………………………unit

F. FIRE PROTECTION

1. Portable fire extinguisher type	Qty	Last check
a. Dry Powder (ABC type) :	-------	------------
b. CO_2 :	--------	------------
c. Foam :	--------	------------
d. Sand :	---------	------------
e. Sack :	--------	------------

f. Clean agent: --------- ------------
2.Fire pump : --------- ------------
3.Fire monitor : --------- ------------
4.Hoses : --------- ------------
5.Nozzle : --------- ------------
6.Hydrant : --------- ------------

G. LIFTING EQUIPMENT
1. Brake : good/not good
2. Clutch : good/not good
3. Control buttons : good/not good
4. Cat head : good/not good
5. Speed transmission : good/not good
6. Hydromatic brake : good/not good
7. Weight Indicator : good/not good

H. MOTORS
1.Combustion Engine
a. Exhaust pipe system : good/not good
b. Engine/rotating port cover :good/not good
c. Tank and fuel pipes : good/not good
d. Exhaust pipe insulator: available/not available
e. Wire terminal/ insulation : available/not available
2. Electric motor/generator
a. Switch box/(on/off) : available/not available
b. Terminal box : available/not available
c. Circuit breaker/Fuse : available/not available
d. Ground wire : available/not available
e. Conductor cable : available/not available
f. Rotating Parts Cover : available/not available

I. MUD PUMPS
1. V-belt cover : good/not good
2. Safety valves : good/not good
3. Mud pressure pipes : good/not good
4. Shale shaker engine : good/not good
5. Mud tank : good/not good
6. Mud mixer : installed/not installed
7. Manometer : installed/not installed
8. Viscosity meter : installed/not installed
9. Density meter : installed/not installed
10 .Safety chain on discharge hoses : installed/not installed
11. Safety valve set : installed/not installed
12. Mud gun : installed/not installed
13. Settling valve set : installed/not installed
14. Waste disposal pit : installed/not installed
15. Degasser : installed/not installed

J. AIR COMPRESSOR CONDITION:
1.Air Tank
a. Working pressure : …………….Psi
b. Date of last inspection:…………….(dd/mm/yy)
2 Accessories
a. Wire terminal / insulation : available/not available
b. Valves : available/not available
c. Manometer: available/not available
3. Air Hoses/Pipes : available/not available
4. Thermometer : available/not available

K. LIGHTING
1. Lamps : good/not good
2. Flood light : good/not good
3. Fog lamps : good/not good
4. Emergency lamp : good/not good
5. Cable installation : good/not good
6. Fuse box : available/not available
7. H_2S sensor at driller consule: available/ not available

L. ALARM SYSTEM
1. General alarm : installed/not installed
2. General alarm switch : installed/not installed
3. Signaling bell : installed/not installed
4. Horn : installed/not installed
5. Sensor near shaker : installed/not installed
6. Sensor near bell nipple : installed/not installed
7. Sensor at driller console/rig floor : installed/not installed

M. CLINIC
1. Doctor/Paramedic : available/not available
2. Medical supplies : available/not available
3. Resuscitator : available/not available
4. Stretcher : available/not available
5. Minor surgery set : available/not available
6. Ambulance : available/not available
7. Automatic external defibrillator : available/not available

N. LIFTING EQUIPMENT
a. **Crawler Crane**
1. SKKP No. :..................................
2. SKKP expiry date : …………………………
3. Issued by : …………………………
4. Owner : …………………………
5. Serial No. : …………………………
6. Model : …………………………
7. Year made : …………………………
8. Maker : …………………………
9. Operator Name : …………………………
10. SIO No : …………………………
11. SIO Eexpiry Date : …………………………
12. Equipment condition: good/not good
13. Hydraulic hose condition: good/not good

b. **Forklift**
1. SKPP No. : …………………………
2. SKPP expiry date : …………………………
3. Issued by : …………………………
4. Owner : …………………………
5. Serial No. : …………………………
6. Model : …………………………
7. Year made : …………………………
8. Maker : …………………………
9. Operator Name : …………………………
10. SIO No. : …………………………
11. SIO expiry date : …………………………

12. Equipment condition: good/not good
13. Hydraulic hose Condition : good/not good

O. PERSONNEL CAMP

1. Physical condition : good/not good
2. Toilet : good/not good
3. Smoke detector : good/not good
4. Ventilation : good/not good
5. General housekeeping : good/not good

P. WASTE TREATMENT

1 Haz Mat storage : available/not available
2. Waste Management : available/not available
3. Sedimentation tank : available/not available
4. Coagulation Tank : available/not available
5. Drilling cut tank : available/not available

Q. ESCAPE ROAD

1. Exit signs : installed/not installed
2. Exit condition : good/not good
3. Location and Escape road map : available/not available

R. FUNCTION TEST TOP DRIVE HIDROLIC

1. Low speed : done/not yet
2. High speed : done/not yet
3. Hydraulic hose connection : done/not yet

<u>COMMENTS/SUGGESTIONS</u>:

1...

2...

3...

4...

5...

Approved by :

____________________ **(Technical Head)**

____________________ **(EBTKE Inspector)**

Witnessed by

________________ **(Company man)**

________________ **(Rig Superintendent)**

________________ **(Safety Representative Company)**

7.2 APPENDIX 2 : LAPORAN DUA MINGGUAN

LAPORAN DUA MINGGUAN

Form LK3-1

DAERAH KEGIATAN : ....
TATA WAKTU : ....
PERUSAHAAN : ....

No. Urut	Perusahaan Pemilik Rig	Nama/Jenis Rig	Lapangan	Nomor Lokasi / Sumur	Jenis Pekerjaan

................................, ...20.....
Penyelidik/Kepala Teknik Tambang

(....)

7.3 APPENDIX 3: LAPORAN PENUTUPAN SUMUR PERTAMBANGAN DARATAN

ATTACHMENT 3
LAPORAN PENUTUPAN SUMUR PERTAMBANGAN DARATAN
DEPARTEMEN PERTAMBANGAN DAN ENERGI REPUBLIK INDONESIA
DIREKTORAT JENDERAL MINYAK DAN GAS BUMI

Model-Xi

PERUSAHAAN : ....

WILAYAH KERJA : ....

NAMA SUMUR : ....

JENIS SUMUR : ....

KOORDINAT : ....

ELEVASI MEJA PUTAR : ....

KEDALAMAN AKHIR : ....

TANGGAL MULAI DI BOR : ....

TANGGAL SELESAI DI BOR : ....

TANGGAL DITINGGALKAN : ....

JENIS INSTALASI PEMBORAN : ....

PENGAWAS PEMBORAN : ....

ALASAN DITINGGALKAN : ....

PIPA SELUBUNG

Pipa Selubung			Lubang sumur			Penyemenan		Ket.
Ukuran (inch)	Kedalaman		Ukuran (inch)	Kedalaman		Jumlah (sak)	SG slurry (ppg)	
	Dari (ft)	Sampai (ft)		Dari (ft)	Sampai (ft)			

SUMBAT SEMEN

Kedalaman		Penyemenan		SG Lumpur (ppg)	Keterangan
Dari (feet)	Sampai (feet)	Jumlah (sak)*	SG Slurry (ppg)		

TEST PENGUJIAN

No.	Kedalaman (feet)	Choke (feet)	Hasil Test			Tekanan Formasi (psi)	Ket.
			BOPD	MSCFD / GPD	BWPD		

*) sak semen = ... kg

CATATAN LAIN-LAIN :

....

....

....

supremeenergy	**SAFETY HEALTH AND ENVIRONMENT WORK RULES**	**PROCEDURE**
CORPORATE	**HYDROGEN SULPHIDE (H_2S)**	SE-MSHE-WOR-PRO-0007 Revision: 0

APPROVAL

	POSITION	NAME	SIGNATURE	DATE
Prepared by	SHE Engineer	Erwin Patrisa Floris		
Reviewed By	Sr. SHE Manager	M. Arief Tarunaprawira		
Approved By	VP Relations & SHE	Priyandaru Effendi		**17/05/2013**

REVISION HISTORY

REV	DATE	BY	REVIEWED	APPROVED	DESCRIPTION
0					For Use

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1 INTRODUCTION

Hydrogen Sulfide (H_2S) is a highly toxic chemical compound that is heavier than air in its gaseous form. It is a colorless and a sweetish taste, flammable gas with a pungent odor at low concentrations. Despite its characteristic odor, sense of smell cannot be relied upon to detect the presence of H_2S because the gas rapidly deadens the sense of smell by paralyzing the olfactory nerve. Exposures to H_2S at concentrations as low as 600 parts per million (ppm) can cause death in a matter of minutes due to paralysis of the respiratory system.

H_2S is a naturally occurring gas that arises from the decomposition of organic material (animal or vegetable) by microorganisms (bacteria). It is found in regions of geothermal activity, occurring around sulphur springs and lakes. It is also found in areas of oil and gas exploitation, in foul sewers and in cesspools (stagnant water) as found in swamps. Along with carbon dioxide it is one of the main hazardous components of the non-condensable gas phase associated with geothermal steam. It is possess a significant risk to personnel working in and around geothermal power generation facilities.

2 CHARACTERISTICS

H_2S is a colorless, flammable gas that may be liquefied under pressure. It can occur in a variety of oil and gas exploration and production operations, and has the following properties:

- **Toxicity.** H_2S is extremely toxic. The lethal concentration is 600-700 ppm
- **Heavier than Air.** H_2S is approximately 19 percent heavier than air (vapor density = 1.19). It tends to accumulate in low or enclosed places such as pits, trenches, enclosed well bays and cellars, sumps, the tops of floating roof tanks, buildings, shale shakers and portable containers. However, H_2S mixed with natural gas may form a lighter-than-air mixture.
- **Soluble in Liquids.** High concentrations of H_2S may be present in crude oil, molten sulfur, tank and pit-bottom sludge, produced water, etc., all which may release H_2S when agitated, heated, or depressurized.
- **Odor.** At very low concentrations, H_2S has a characteristic odor suggestive of rotten eggs. However, smell cannot be used as an adequate means of detecting its presence because hydrocarbon vapors in asphalt, banker fuel and some crude oils can mask the rotten egg odor.

  Additionally, at higher concentrations (>100 ppm), H_2S deadens the sense of smell, leading people to believe falsely that no H_2S is present. Consequently, sense of smell is not dependable as a means of detection.
- **Flammable.** H_2S is an extremely flammable gas with a wide range of flammability (4.3-45.5% by volume in air). When burned, H_2S forms sulfur dioxide (SO_2), which is a colorless, highly toxic and very pungent gas.
- **Highly Corrosive.** H_2S accelerates corrosion, producing a general loss of metal and strength, deformation, and cracks. Copper alloys corrode rapidly in H_2S service.
- **Reactive.** In an oxygen-deficient atmosphere, iron and steel will react with H_2S to form iron sulfide deposits on the surface of the metal. Some iron sulfides (known as pyrophoric iron sulfide) are unstable and when exposed

to air will undergo a rapid chemical reaction creating an ignition source that should be considered during equipment shutdowns.

3 HEALTH EFFECTS/TOXICITY

3.1 HEALTH EFFECTS AND EXPOSURE STANDARDS

- Depending on the concentration, the effects of acute exposure to H_2S may range from detecting a recognizable odor to causing death.
- H_2S oxidizes rapidly in the body, and there are normally no permanent aftereffects from acute exposure if the victim is rescued promptly and resuscitated before experiencing prolonged oxygen deprivation.
- Symptoms from repeated exposures to low concentrations usually disappear after not being exposed for a period of time.
- There is little or no data on the effects of chronic exposure; however, frequent exposures to low concentrations that do not produce effects initially may eventually lead to irritation of the eyes, nose, and throat.

3.2 GENERAL PROPERTIES

- colorless gas having an offensive odor (rotten eggs) and sweetish taste
- slightly heavier than air with a specific gravity of 1.19 (air = 1.00@15^{o}C)
- highly flammable (auto ignition temperature of 500^{o}F)
- explosive limits in air 4.3% (lower explosive limit) to 46% (upper explosive limit). (43,000 ppm to 460,000 ppm volume/volume)
- moderately soluble in water and alcohol
- boiling point - 60.2^{o}C
- flash point - 83.8^{o}C
- corrosive to metals and to a lesser extent masonry and concrete materials
- toxic to humans.

3.3 HUMAN HEALTH EFFECTS AND TOXICITY

Table 7.1-A (ppm) and Table 7.1-B (**mg/m^3**) presents human health effects for exposures to a range of H_2S concentrations, based on ANSI Standard No.237-2-1972.

Table 7.1-A: Human Health Effects for Exposures to a Range of H_2S Concentrations (ppm)

H2S in Air By Volume		Health Effects
ppm	%	
0.13	0.000013	Minimum concentration, where H_2S gas can be smell
4.60	0.00046	Easy to detect, the odor can be smell
10	0.001	A small percentage of workers may experience eye irritation. Threshold Limit Value (TLV) for an eight-hour Time-Weighted Average (TWA) recommended by the American Conference of Governmental Industrial Hygienists (ACGIH).
20 - 27	0.002 - 0.0027	Strong unpleasant odor, could not be tolerate and possible stay in the area in 15 minutes (STEL).
100	0.01	Deadens sense of smell in 2 to 5 minutes (IDLH) and may cause coughing, and burning of the eyes and respiratory tract.
200	0.02	Immediate loss of sense of smell. Marked eye and respiratory irritation.
300	0.03	The maximum concentration from which one could escape within 30 minutes without a respirator and without experiencing escape-impairing or irreversible health effects. Generally recognized Immediately Dangerous to Life and Health (IDLH) concentration.
500	0.05	Respiratory disturbances in 2 to 15 minutes. Dizziness, collapse, and unconsciousness after half to one hour
700	0.07	Loss of consciousness quickly. Breathing will stop and death will result if not rescued promptly.
1000	0.10	Immediate unconsciousness. Death in three to five minutes.

Note: 1% = 10.000 ppm

H_2S causes nuisance from its unpleasant odor at concentrations well below those that cause physical health effects. However, continuous exposure to H_2S reduces a person's sensitivity to it.

Table 7.1-B: Human Health Effects for Exposures to a Range of H_2S Concentrations (mg/m^3)

H_2S Concentrations mg/m^3	Health Effects
0.0002 - 0.002	Level of human detection (depending on H_2S purity).
0.016 - 0.02	Smells like rotten eggs.
15	Eye irritation.
70	Permanent eye damage.
225	Paralyses olfactory so odor is no longer a warning signal of the presence of H_2S.
400	Over stimulates the central nervous system, causing rapid breathing, followed by cessation of breathing, convulsions and unconsciousness.
1400	It is lethal (Immediate unconsciousness, death in three to five minutes)

Little information is available on the effect of chronic exposure to H_2S. Adverse effects have been observed in occupationally exposed populations at average concentrations of 15 to 30mg/m^3. Symptoms include restlessness, lack of vigor, and frequent illness. In occupationally exposed groups, at concentration of 30mg/m^3 or more, 70% complained of fatigue, somnolence, headache, irritability, poor memory, anxiety, dizziness, and eye irritation.

4 OCCUPATIONAL HEALTH EXPOSURE STANDARDS

Occupational health exposure standards for individuals exposed in the workplace to various chemical compounds have been set by a range of governmental organizations. These standards are commonly referred to as Threshold Limit Values or Workplace Exposure Standards.

The American Conference of Governmental Industrial Hygienists (ACGIH) *Threshold Limit Values and Biological Exposure Indices* is regarded by most western international occupational safety and health organizations as the benchmark document for the setting of occupational health standards for worker exposure to chemicals.

The 1993-94 Threshold Limit Values for hydrogen sulfide are as follows:

- TLV-TWA 10ppm (14mg/m^3)
- TLV-STEL 15ppm (21mg/m^3)

The TLV (Threshold Limit Value - Time Weighted Average) is defined as the time weighted average concentration for a normal eight hour work day and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day, without adverse health effects.

The TLV-STEL (Threshold Limit Value - Short Term Exposure Limit) is defined as the 15 minute time average which should not be exceeded at any time during the work day even if the eight hour time-weighted average is within the TLV-TWA. Exposures for the TLV-STEL should not be longer than 15-minutes and should not be repeated more than four times per day, with at least 60-minutes between successive exposures to the STEL.

A worker will be required to wear respiratory protective equipment for exposures to hydrogen sulfide concentrations exceeding 50% of the published Threshold Limit Values.

Steps in determining what respiratory protection is required to protect against a known H_2S concentration are presented in **Table 7.2**.

Table 7.2: Hierarchy of Respiratory Protection For H_2S Exposure

Concentration	Activity	Respiratory Equipment Requirements
□□10 ppm	• Entry for work or rescue, < 8 hours only • Emergency egress	Respiratory protection not required but personal exposures should be continuously monitored whenever H2S hazards may exist.
> 10 ppm, < 300 ppm	• Entry is permitted for work or rescue • Emergency egress	• Self-contained, positive-pressure breathing equipment (SCBA) • Positive-pressure/pressure-demand air-line breathing equipment coupled with a SCBA rated for a minimum of fifteen minutes • Positive-pressure/pressure-demand air line breathing equipment with an auxiliary self-contained air supply rated for a minimum of 5 minutes if the air-line is connected to a source of breathing air
> 300 ppm	No entry except for rescue • Emergency egress	Requires the same equipment as above (>10 ppm) but also with a second SCBA-equipped person nearby in a safe area for rescue.
Note: Gas mask canister-type or air purifying (negative pressure) respirators are not recommended for controlling exposures to H2S.		

5 H_2S HAZARDOUS ACTIVITY

5.1 HAZARDOUS AREAS

There are areas/activities at each site where hydrogen sulfide could be encountered at a concentration that poses a significant hazard to workers, for which safe work practices and permit-to-work systems will need to be rigorously adhered to.

These areas should be identified as part of the sites hazard identification and assessment process, and recorded on the Site's Hazard Identification Register (see **SE-MSHE-WOR-PRO-0023 Hazard Identification, Assessment and Control**).

- process vessels and related equipment, condensers, cooling towers and boilers
- spaces and areas located below ground such as basements, hot well pits, wellhead cellars, vaults, excavated ditches and holes
- enclosed spaces such as steam-lines, sewers, sewer manholes, wet wells, and vessels
- areas near to lines, rock mufflers, silencers, etc. which vent gases which may contain hydrogen sulfide
- any ditch or opened topped vault where air circulation is poor so hydrogen sulfide can accumulate at the bottom.

5.2 DESIGNATED HAZARDOUS AREAS

Areas where there is potential for hydrogen sulfide to accumulate and pose a risk to worker safety will be identified at the site.

Personnel trained in working in areas where hydrogen sulfide may be present and holding the appropriate permits-to-work, shall be authorized to undertake work in the hydrogen sulfide Designated Hazardous Areas. Specific actions with regard to work control and for entering a confined space are detailed in **SE-MSHE-WOR-PRO-0018 *Permit to Work Systems*** and **SE-MSHE-WOR-PRO-0013 *Confined Space*.**

5.3 WORK IN AND AROUND AN AREA WITH HYDROGEN SULFIDE PRESENT

The following general safe work practices should be observed by all personnel working in an area where a hydrogen sulfide gas hazard may be present. Specific safe work practices shall be adhered to for work in Designated Hazardous areas.

- When approaching a job site, check for any obvious sources/signs/smells of hydrogen sulfide.
- Check the general condition flags, sign posted at the site:

RED	Condition III - extreme danger to life. H_2S has reached injurious levels (above 50ppm). Do not enter area (drilling).
GREEN	Safe to work/enter.
YELLOW	Condition I - caution, possible H_2S hazard.

- Condition II - moderate danger to life is indicated by the display of yellow/black format signs with the words ‘Danger’ and ‘Poison Gas’. This condition is when H_2S is 10 to 49ppm. Non-essential personnel shall proceed to Safe Briefing Areas.
- Identify the location of the nearest ‘Safe Briefing Areas’ which will be sign posted.
- Check the wind direction by observing the wind socks and streams which are located throughout the site. Wind socks should be checked on a regular basis

throughout the working shift, to ensure changes in wind direction are not overlooked.

- Remember H_2S is heavier than air, so avoid low lying areas. If an area or trench is suspected of containing H_2S gas, do not enter without following permit-to-work procedures. Gas testing must be performed before entering.
- Observe all warning signs at the site (as specified above).
- Do not attempt to enter any restricted Designated Hazardous Area without the appropriate authorization.
- Be aware of the location of emergency escape breathing apparatus (ELSA).
- In the event of an emergency, follow the site's excavation drills, which you must know.

Emergency Action:

- Should you encounter someone overcome by H_2S, **DO NOT ATTEMPT TO RESCUE THE PERSON.** Only persons wearing Self Contained Breathing Apparatus should enter the area.
- As quickly and as safely as you can, raise the alarm.
- Advise emergency personnel of the location of the incident and number of personnel involved.
- Let the personnel trained in emergency rescue etc. carry out the rescue.

5.4 SPECIFIC SITE WORK PRACTICES

For all personnel entering Designated Hazardous Areas or equipment where hydrogen sulfide is a known potential hazard, the permit-to-work system shall be followed at all times.

For entry into confined spaces, the requirements of the confined space permit-to-work and entry permits shall be followed. These permits and the steps required in actioning them are detailed in **SE-MSHE-WOR-PRO-0018** ***Permit to Work Systems*** and **SE-MSHE-WOR-PRO-0013** ***Confined Space.*.** Please refer to these sections.

6 HYDROGEN SULFIDE DETECTION/MONITORING

Hydrogen sulfide levels should be monitored in any work area that may reasonably be expected to exceed an atmospheric concentration of 5 ppm (one-half of the Threshold Limit Value). Two broad categories of monitoring devices available: fixed systems and portable units. There are three types of monitoring systems currently used to detect/monitor hydrogen sulfide concentrations.

6.1 FIXED MONITORING SYSTEM

This system is commonly used in a process or drilling environment and is used to detect leaks/failures from process equipment, e.g. condenser. The main features of the system are listed below.

- Fixed monitoring systems, which continuously measure the concentration of H_2S in an atmosphere, should be installed in facilities containing process equipment handling steam/gases or fluids containing H_2S when the locations are both an enclosed area (room, building, or space) and are inadequately ventilated. (Inadequately ventilated is defined as ventilation that is not sufficient to prevent the accumulation of H_2S in concentrations exceeding 10 ppm.)
- A number of electronic sensors are placed at strategic locations in the workplace.
- The sensors send an electronic signed to a master control system which, via a computer terminal or screen, displays the H_2S concentration recorded for each sensor.
- The H_2S concentration is usually measured as parts per million (ppm) and alarm points can be set, so when H_2S concentration exceed the Workplace Exposure Standard (10ppm), a Hi alarm is activated with a general evacuation alarm (Hi Hi) set when the H_2S concentration exceeds 20 ppm.

A single Hi indication will initiate a control room alarm and two Hi's or a single Hi Hi will initiate appropriate automatic shutdown of wells or production train, as appropriate.

Audio visual alarms will be installed in areas where fixed monitors are installed (wellheads, condenser area). The audio visual alarms will coincide with alarm signals generated by the fixed H_2S monitoring system. They will be distinct in sound and color from all other alarms at the site.

The drawback of such a system is that it is primarily designed to detect process leaks and covers only a small percentage of the workplace. The positioning of sensors is critical if one is to use such a system for personnel protection.

Note: In all instances, one should manually test the atmosphere using a personal H_2S monitor or personal gas detector prior to entry, to verify that the Fixed Monitor System reading is correct.

6.2 PERSONAL PORTABLE H_2S MONITOR

- Personal electronic monitors are small devices designed to fit in a shirt pocket or attach to a belt to provide personnel with monitoring and early warning of an H_2S release in their immediate work area
- Personal electronic monitors should be used when the atmospheric concentration of H_2S in a person's immediate work area could exceed 10 ppm and fixed monitoring systems are not installed or do not provide adequate coverage of the immediate area
- These units are electronic, using electrochemical cells and are usually hand-held or belt mounted.
- The measure H_2S concentrations continuously, providing a digital read out of the concentration in ppm.
- They are fitted with audible alarms which are activated when concentration exceed a predetermined action level, (usually TLV-TWA).

- Monitors should be held or worn as low as possible, definitely no higher than the waist.

6.3 PERSONAL DETECTORS

There are a number of personal detectors that can be used. These units are usually supplied with a hose extension which allows the base of wells, sumps, cellars, etc. to be tested without the testing personnel having to enter the potentially contaminated work area.

Portable H_2S Detectors use a battery-operated pump to pull air/gas samples to a sensor. They can be used with an extendable wand and hose to test an atmosphere without requiring a person to enter the area.

Portable H_2S detectors are generally used to test spaces for the presence of H_2S before conducting work in the area and to search out release sources.

Two common type of devices are listed below.

i) Colorimetric Tape Detector Units.

This unit takes a sample of gas, passes the gas onto a reaction chamber and, via a reaction mechanism, and produces a stain on a tape. The color and depth of the stain indicates the concentrations of H_2S.

These units are not suitable for high concentrations, as they are primarily used to measure low concentrations of H_2S in ambient air.

ii) Colorimetric Gas Tube Detectors.

This type of unit incorporates a pump, colorimetric detector fuse and a scale for reading of three concentrations of H_2S detector. There are a number of commercial types available, with the most common being Drager and Gastec.

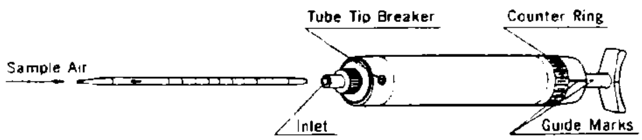

Figure 7.2 Typical Colorimetric Tube Gas Detector

6.4 PROCEDURE FOR USING COLORIMETRIC TUBE GAS DETECTOR

Set Up

The sampling and measurement procedure for the Gastec system is detailed below.

1. Break tips off a fresh detector tube by bending each tube end in the tube tip breaker of the pump.
2. Insert tube securely into pump inlet with arrow on tube pointing toward pump.

To Sample Air

3. Make certain pump handle is all the way in. Align guide marks on pump body and handle.
4. Pull handle out to desired stroke volume. Handle can be locked on either ½ pump stroke (50ml) or one pump stroke (100ml).
5. Read concentration at the interface of stained-to-unstained reagent when staining stops. Unlock handle by making ¼ turn and return it to starting position.
6. Where more pump strokes are indicated in the instruction sheet included in each box of tubes, take additional sample by repeating pump strokes without removing tube.

An extension hose can be used to detect gas concentration in vessels and sumps etc. Measurements shall be carried out by only persons trained in the correct use of the gas detector.

7 MAINTENANCE AND CALIBRATION OF H_2S MONITORS

Due to the hazard poised by equipment failure, all H_2S monitoring equipment will be inspected on a regular basis for defects and corrosion. This work will be undertaken by SUPREME ENERGY equipment technicians.

Fixed and portable monitors will be routinely calibrated and maintained in accordance with manufacturer's requirements to ensure that H_2S monitoring and alarm systems continue to operate properly.

Calibration records will be kept to show when the unit was calibrated, by whom and the results of the tests. Only trained personnel should calibrate, test, and conduct maintenance on monitoring equipment. Since known concentrations of H_2S are utilized to calibrate monitoring equipment, such work should only be carried out in well-ventilated areas.

8 VENTILATION

Hydrogen sulfide is one to two times heavier than air and does not readily dissipate. It tends to accumulate in low lying areas and confined spaces. As stated earlier, these areas must be tested for H_2S concentrations before entering.

If areas are found to contain H_2S, forced ventilation can be applied to remove the accumulated gas and make the areas safe for entering. See **SE-MSHE-WOR-PRO-0013** *Confined Space* for further details.

9 TRAINING

All employees subject to H_2S exposure in their work areas should receive appropriate initial and periodic training that addresses the following,
(general requirements refer to Chapter 3, Section …: Safety Training):

- Hazards, characteristics, and properties of H_2S
- Sources of H_2S
- Proper use of H_2S detection methods used in the workplace
- Symptoms of H_2S exposure

- Rescue techniques and first aid to victims of H_2S exposure
- Proper use and maintenance of breathing equipment including fit testing and demonstrating proficiency by donning equipment.
- Workplace practices and relevant maintenance procedures that have been established to protect personnel from the hazards of H_2S
- Wind direction awareness and routes of egress
- Recognition of and proper response to warning signals or alarms and procedures to follow during an alarm condition
- Locations of emergency assembly areas and shelter-in-place locations
- Employees should also participate in periodic drills to practice using breathing apparatus and rescuing workers. Contractors should be required to provide training to their employees unless the company agrees to do so.

H_2S trained personnel should receive badge-sized plastic laminated certificates that should be shown when entering H_2S restricted areas.

supremeenergy	SAFETY HEALTH AND ENVIRONMENT WORK RULES	PROCEDURE
CORPORATE	PERMIT TO WORK	SE-MSHE-WOR-PRO-0008 Revision: 0

APPROVAL

	POSITION	NAME	SIGNATURE	DATE
Prepared by	SHE Engineer	Erwin Patrisa Floris		
Reviewed By	Sr. SHE Manager	M. Arief Tarunaprawira		
Approved By	VP Relation & SHE	Priyandaru Effendi		**17/05/2013**

REVISION HISTORY

REV	DATE	BY	REVIEWED	APPROVED	DESCRIPTION
0					For Use

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1 INTRODUCTION

This procedure shall cover all SUPREME ENERGY non-routine activities such as maintenance or repair work that may contain any significant hazards under any specific circumstances. Routine activities shall refer to relevant Standard Operating Procedures.

As discussed in the hazard identification section of this procedure, activities or work carried out at a facility will invariably involve hazards that could lead in injury. It is therefore important that all work is controlled in a manner that will ensure safety. Clearly this control must be practical and enable the work to be completed effectively and efficiently.

2 APPROPRIATE CONTROL MEASURES

Work that is related directly to the purpose of the facility can be expected to be performed repeatedly under known conditions (e.g. synchronizing supplies, changing over production wells). It is therefore possible to assess the associated hazards and set out any necessary precautions. However, some work such as defect repair may have to be carried under a range of differing conditions and therefore hazards. The precautions necessary to ensure safety cannot therefore be fully developed beforehand and so need to be considered at the work planning stage. Work control for this ‘abnormal’ or ‘non-routine’ type of work therefore needs to be quite different to that for ‘normal’ plant operation.

Typical activity-based work control measures can be summarized as:

- All activities
  - Hazardous Area Access Permits
  - Special Procedure Forms
  - Safe Work Practices
  - Technical Instructions
  - Work Permits
- Operation of high energy systems (e.g. steam systems, hydraulic services, power plant)
  - Standard Operating Procedures (SOPs)
  - Emergency Operating Procedures (EOPs)
  - Standing Orders
- Maintenance and repair
  - Work Permits
- Commissioning/Testing
  - Special Technical Procedures
  - Test Procedures
- Major Works (construction, drilling, overhaul)
  - Contractual requirements
  - Work Permits.

3 DEFINITION

3.1 Non-routine activities

Non-routine refers to any activity that is outside regular operation of the plant or installation that is not covered by Standard Operating Procedures; or where persons may be put at risk due to location, surrounding conditions, hazards or other activities. In this respect maintenance and construction activities are considered as non-routine. A permit is required prior to any non-routine activity, even if frequently carried out. If there is any doubt regarding the need to raise a permit then one should be used.

3.2 Permit-to-Work

Is a signed statement by ‘Authorized Person’ and ‘Performing Person’ and authorized by Operational Supervisor that a particular job will be carried out according to stated precautions and under specific conditions within a specified period of time.

3.3 Hot Work

Refers to any activity that involves the generation of intense heat such as welding, grinding, flame cutting, or use of non-intrinsically safe electrical equipment at the area where existence of flammable material is possible

3.4 Confined Space Entry

Refers to any enclosed or partially enclosed space, either above or below ground, where there is some risk of reduced oxygen supply or accumulation of non-condensable gasses, toxic materials, steam exposure, flammable or explosive materials, or where means of entry or exit are limited.

3.5 Hazardous Areas

Refers to certain areas that because of the nature of hazards are identified in that area.

3.6 Excavation work

Refers to any activities to move ground in order to make a hole or channel or sloping, etc. on the ground by digging more than 30-centimeter depth.

4 SPECIAL TECHNICAL PROCEDURES AND TEST PROCEDURES

Complex work on systems and equipment such as during commissioning and testing often involves personnel following non-standard procedures and sequences. In addition, during testing, systems and equipment may be subjected to conditions that are nearer to those which they were designed to withstand. As a result the hazards faced by personnel during these times are higher than normal. These increased hazards therefore need to be managed with particular care.

Whenever unusually complex or unusual work is intended to be carried out on systems or equipment, a special procedure is to be written. This is to be written by an engineer of suitable experience and reviewed by a group of personnel drawn from all affected disciplines. Such a group shall consider hazard management and safety as a separate agenda item before authorizing the use of a procedure. The site safety officer is to be an ex-officio member of all such special procedure groups.

Once proven in use, special procedures are to be registered and retained to form the bases of future special procedures. All such procedures are to be reviewed prior to re-issue to ensure all assumptions made regarding prior conditions are still relevant and correct.

5 PERMIT-TO-WORK SYSTEM

5.1 Introduction

Formal Permit-to-Work systems, developed through many years' experience, are a major factor in the safety of mining industries including geothermal, oil and gas, chemical and power generation.

The system used by SUPREME ENERGY draws on this prior experience and is designed to ensure safety within a practical and efficient level of control. The system is to be reviewed by SUPREME ENERGY management from time to time and if necessary refined in the light of reports from site Health and Safety Committees.

5.2 Permit-to-Work Overview

Work Permit

Signed statement by an authorized person that a particular job may be carried out with stated precautions. Permits are designed to aid safe job planning and co-ordination.

General Work Permit (GWP)

The main permit raised for each job. Other specific permits may be used to support it.

Specific Work Permits and Plans

Specialized permits that cover specific types of situations or areas. Plans aid work planning in the same way as permits, but do not need to be authorized by a technical or area supervisor.

Certificate

Signed statement that specifies checks or tests have been carried out by an authorized person and that conditions are acceptable, (e.g. Gas Test Certificate). Certificates do not replace permits; they are complementary.

High Voltage

High voltage is the term applied to electrical equipment that operates at more than 600 volts (terminal to terminal), or more than 300 volts (terminal to earth). High current AC or DC power supplies are to be considered as High Voltage. See Section …: *Electrical Safety* for further information.

Permit Applicant

The person who raises a permit. This is always the employee or contractor in direct charge of the work or immediate work site. They are to be of an appropriate engineering discipline. Where the job involves work on High Voltage equipment or systems, the permit applicant must be an electrical engineer.

Permit Holder

The person in charge of the job and who formally holds the authorized permit. The permit applicant becomes the permit holder when the permit is authorized.

Operational Supervisor

The leader of the section of the installation authorized by the Site Leader to grant General Work Permits in the area concerned. The area should be a defined section of the installation (usually defined by the system or service covered). The Operational Supervisor will usually be the line or department supervisor directly responsible for the physical operation of that section of the installation.

Area Supervisor

The person authorized by the Site Leader to grant Hazardous Area Work Permits, (a type of specific work permit), for areas where they hold specific responsibility. This authority to grant area permits may be delegated to suitably qualified personnel.

Technical Supervisor

The person with particular training and knowledge authorized by the Site Leader to grant Specific Work Permits.

Shift Supervisor

The operations employee with current responsibility for the operation of the installation or section thereof. Out of normal working hours this person is likely to have operational responsibility for the whole site.

Authorized Gas Tester

This term is used to describe a person who is trained to perform gas tests and authorized to issue Gas Test Certificates (in support of specific work permits, etc.).

5.3 Intent and Applicability

Permit-to-Work system is intended to reduce the chance of misunderstandings when ‘non-routine’ activities are to be carried out on operational plant, systems or equipment, or where normal activities are carried out under ‘non-standard’ conditions. These are situations where unknown or un-assessed hazards may occur. In doing so it attempts to safeguard people and property. The system is to be used within all SUPREME ENERGY operational facilities. The term ‘non-routine’ is defined under Definitions above.

An example of when a work permit may or may not be required is that of painting. A permit clearly is not appropriate to paint the ground floor windows of an administrative building. However, if the same otherwise safe activity was to be carried on an explosives store, a permit would enable suitable precautions to be put in place to safeguard the personnel and site.

The Permit-to-Work is a system that enables work to be planned and authorized to allow all associated hazards to be considered and the risks mitigated. The Permit-to-Work system does not in itself make the job safe; that can only be achieved by the persons using the system and carrying out the activity.

The same permit system is to be used to control work being carried out by SUPREME ENERGY personnel and contractors alike. The only place and time it may not apply is when an area has been designated a contractor-controlled area. In these cases, alternative permit systems that meet SUPREME ENERGY contractual requirements will be used. (See Section *…: Contractor and Construction Safety*). However, it is of note that a General Work Permit (GWP) may be appropriate to manage the isolation boundary around a construction or drilling site.

5.4 Aim of Permit System

The aim of the permit system is to;

- prevent harm to individuals or plant during 'non-routine' activities
- allow proper co-ordination of site activities

This is achieved by;

- ensuring proper authorization of non-routine or hazardous work
- aiding complete job planning
- setting time, scope and area limits
- facilitating hazard identification, assessment and mitigation
- facilitating the obtaining of second opinion to reduce the chance of errors
- ensuring information exchange and work co-ordination
- aiding job and team briefing.

5.5 Training

All personnel, whether employees or contractors, who may be required to carry out work within SUPREME ENERGY' installations are to be aware of the permit-to-work system.

The minimum level of awareness shall include:

- basic outline of how the permit system functions and why
- there is a General Work Permit supported by additional specific permits
- tags are and that they must never be ignored
- a tag-out and lock-out system is used
- who to ask if in doubt.

All personnel who are expected to work regularly under the control of permits are to have additional training that shall include the items listed below:

- What permits are used, when they are used, what information they hold, and how they link to the General Work Permit.

- How to check that the appropriate permit is in force and what hazard controls have been put in place.

- Where original permits are held and where to expect to see copies posted.

- What tags are used on site, and what information they convey.

- How the tag-out/lock-out system is used and how to check that a system is safe to work on.

Any personnel who may be expected to be put in charge of work requiring permits to be raised may be required to become a Permit Holder. To this end all such persons are to be fully trained in the completion and use of permits, tags, and lockouts. The same requirement applies to Supervisors and the site safety staff.

6 FUNDAMENTAL APPROACH

The Permit-to-Work system is based upon a structured, systematic and disciplined approach to work planning that enables work to be correctly organized and co-ordinated. In particular, it requires all associated hazards and the necessary precautions to be identified. Permits are designed principally to aid safe work planning and hazard management.

The Permit-to-Work system is built around a General Work Permit (GWP) Form that is supported by additional specific permits when required. The General Work Permit allows the appropriate level of control and planning to be applied: minimal control on simple low-risk activities, and graduating to strict and sometimes involved control on potentially high-risk undertakings.

The work planning method outlined in this section follows a clearly defined and formalized process that aids the professional thought process that a worker should naturally apply prior to commencing a job. It consists of a series of fundamental steps, namely:

- work scoping and planning (what, when, who, how, etc.)
- hazard/risk identification and management
- authorization
- making systems and equipment safe
- execution of work
- re-commissioning.

6.1 Permits and Associated Documentation

The permits, certificates, and plans are:

- General Work Permit
- Hazardous Area Permit
- Specific Work Permit:
  - Hot Work Permit
  - Confined Space Entry Permit
  - Excavation Plan
  - Change Permit (whenever require).
- Atmospheric Testing Certificate
- Electrical Isolation Certificate

The specific work plans are:

- Scaffolding Plan
- Mobil Crane Plan
- Purging Plan

Associated documentation required by the permit system includes:

- General Permit Log
- Site/Field/Plant Status Boards
- Tag-out Tags
- Caution Tags
- Test Forms
- ‘Awaiting Test’ Log

Copies of the General Work Permit, Hazardous Area Permit, Specific Work Permits, and Certificates are at the end of this section (see Appendixes).

Other permits are presented in the appropriate sections of this procedure. Additional information required by to those raising permits includes:

- system diagrams
- site plans
- site/field/plant status (from boards/control screens, etc.).

Additional hardware is required by the Lockout/Tag-out system that accompanies the permits. This includes:

- padlocks (individually keyed and numbered)
- locking chain
- purpose-designed locking devices
- built-in locking facilities
- lockable key boxes
- master key boards
- wall mounted system status boards.

6.2 Control of Permits

The correct administrative control of permits is fundamental to the safe working of the system. Permits are to be managed from a minimum number of points. Normally this will be the main plant control room. If more than one permit control point is used then a clear demarcation of responsibility is to be stated with the main plant control point remaining the lead point, where a master log of all permits raised is to maintain.

6.3 General Work Permit (GWP)

The General Work Permit consists of a single A4 sheet (see *Appendix 3 – General Work Permit*). It is divided into a number of sections that reflect the work planning process. As stated before the GWP is designed to form a planning frame work to ensure that all ‘non-routine’ work, or other work performed within a ‘nonstandard’ situation is carried out safely. In particular, it facilitates a systematic hazard identification and assessment process, as well as facilitating a second opinion and authorization step.

The GWP will be initiated by the need to carry out work. This will normally be by a defect report, work request, or other administrative process. GWPs will normally be raised by the maintenance section of the appropriate department.

6.4 General Work Permit Log

A log book is to be kept at the main control point (usually the plant control room) in which a record of all GWPs is kept (those in force and pending). The log is to record:

- the GWP identity number
- date raised
- the Permit Holder's name
- a brief description of the work
- the system/equipment being worked on
- location of work
- review period (where applicable)
- key box number (if applicable)
- date work started
- date work completed
- review complete boxes.

Example GWP Log headers are reproduced here:

Example of GWP Log (Left Page)

Permit Number	Permit Applicant/Holder	Work System/Equipment Location	Key Box Number

Example of GWP Log (Right Page)

Work Started (Sign/Date)	Review Period	1st Review (Sign/Date)	2nd Review	Work Completed Date

6.5 Completion of General Work Permit (GWP)

The completion process of using the GWP is shown in the flow process outline in *Appendix 1 – Permit-to-Work Flow Process*.

- Each section is to be completed as required.

- Where there is no information for a section of the form then the reason for the omission is to be noted. For example, if no hazard is posed by any systems then “no isolations required” or other similar note is to be added under the Isolation Boundary section.
- Where it is necessary to use additional pages then ‘see attached sheet’ is to be noted in the relevant section of the GWP. All of the details relating to that section are then to be shown on the attached sheet. In this way accidental loss of the additional sheet would become obvious.

The following steps are to be carried out by the Permit Applicant when raising a GWP:

1. Obtain a sequential permit number from the GWP log (if not pre-printed).
2. Insert the current date.
3. Include relevant references to identify the reason that the work is required (e.g. maintenance instruction number, work request number, etc.)
4. Identify and list the equipment and systems to be worked on.
5. Briefly describe the work to be done. Include enough detail to allow a general understanding of the nature and extent of the work.
6. Note the location of the work.
7. Record the Permit Applicant’s name and department. This is always to be the person who will be in direct charge of the work or work site.
8. Note the expected duration of the work. This is the duration from preparing the work site to final completion and anticipated sign-off of the GWP.
9. Discuss the work with the appropriate operators to identify the implications to the plant and systems. State the effect on the plant, systems, services and the site. This is to include the implications on stand-by, back-up, and safety related systems or facilities.
10. Use the prompts given on the GWP to carry out a hazard identification process for the work. This is to relate to the workers directly involved in the work as well as all other employees, contractors, or members of the public. Where the work is complex or particularly hazardous a more comprehensive hazard management planning stage shall be undertaken. (See Section: …: *Hazard Identification, Assessment and Control*).
11. Tick against the appropriate work type in response to the question *‘Does the work require..’*. Each type of work listed requires a Specific Work Permit or Plan (see below). These additional permits are to be completed and authorized after preparation for the work has been authorized (signature box (i) but prior to the Permit Applicant stating that he/she is ready to start the work (signature box (ii)).
12. Inspect system drawings to identify the isolation boundary necessary to ensure the work site will be safe. Seek advice from operators, as necessary, to minimize the effect on the plant. List all tag-out tags required, and the isolation points that also require to be locked (see Section …: Tag-out and Lock-out procedures).
13. Consider what other precautions are required such as barriers, signage etc. List them. Include a review period.

14. Consider whether there will be confined energy that will need to be released prior to work. Consider all energy types including pressure, electrical, mechanical, chemical, etc. State how energy will be released, removed or dissipated, and how a safe state will be confirmed.

15. List any tests that will be required before, during, or after the work is complete. Consider all associated safety implications and list all precautions necessary. If testing is complex or hazardous then a separate test procedure shall be used and attached to the GWP. (See Subsection 6.4*: Special Technical Procedures and Test Procedures*.)

16. The Permit Applicant is to take the completed GWP to the Shift/Operational Supervisor for approval and authorization. The supervisor signs to approve the work plan and precautions included therein, to acknowledge that he/she is aware that the work is to be carried out, is in agreement with the permit review period, and that preparations for the work may proceed. He/she thereby releases the equipment or systems for work and up-dates the system status board and control screen as appropriate. It is of note that the Supervisor may require that additional specialists review the plan when unusual or highly specialized hazards or work are involved (e.g. radiography, in situ grinding, etc.).

17. Raise all appropriate Specific Work Permits and Plans to support the work.

18. Complete all preparations to start the work and manage the hazards.

19. Request operators to carry out any system and equipment isolations required (Section …: Tag-out and Lock-out). Complete tag-out/lock-out.

20. Permit Holder briefs the work team. This is a particularly important step as workers cannot keep themselves safe if they do not understand the intended plan or the hazards they face.

21. Sign signature box (iii) to state that hazards have been, or are being, managed (including release of energy), workers have been briefed, and to certify the tag-out/lock-out is enforce.

22. Obtain shift or operational (as appropriate) supervisor's signature and permission to start work.

23. Carry out work while keeping all hazard management precautions under review, and all workers briefed.

24. Carry out any testing required in accordance with the precautions and safeguards previously stated (obtain authorization where required). Record results.

25. Permit Holder to confirm by signing (box (iv)) that all work and testing is complete, and that the equipment/system is ready for commissioning.

26. Permit Holder briefs Shift/Operational Supervisor on the work-site and systems/equipment and requests that systems/equipment be accepted for commissioning. Further testing that needs to be carried out following commissioning, are to be reported. Once the Supervisor is content he/she signs acceptance of the equipment/systems for commissioning. There may be test and/or commissioning requirements that have not, or cannot, be completed immediately due to the state of the plant. Then a note is to be made in an appropriate

commissioning/test log to ensure that the requirements will be fulfilled within a specified time period.

27. Permit Holder ensures that all other permits have been signed-off and that the work site is restored to a safe and correct state (see Section …: *Housekeeping*). Sign off Permit Log.

28. Operational Supervisor signs (box (vi)) to acknowledge that the work is complete in all respects, that the test/commissioning log has been completed where appropriate, and to close the GWP.

6.6 Review of Work under a GWP

When work continues for an extended period (e.g. longer than a week) it is possible that the work situation or surrounding conditions may change. As a result, the original precautions may become inadequate. Additionally, errors may be made that could threaten the safety of personnel, whether involved in the work or not. It is important therefore that reviews are undertaken at appropriate periods to confirm that a safe environment is being maintained.

Setting the Review Period

- The Permit Holder is to suggest a review period based upon the complexity and anticipated duration of the work.
- The Operational Supervisor is to discuss this and modify it as deemed necessary prior to authorizing the work.
- The period is to be entered into the GWP log prior to work starting.

Undertaking the Reviews

- The reviews are to be carried out by the operations section of the relevant department.
- Operational Supervisors are to ensure that personnel instructed to carry out reviews have sufficient understanding of the permit system to identify discrepancies or when unsafe conditions exist.
- The reviews are normally to be undertaken during the quiet hours (out of normal work hours).
- On completion the reviewer is to sign off the appropriate column of the GWP Log noting if any discrepancy has been found.
- Any discrepancies are to be brought immediately to the attention of the Shift Supervisor who will instigate appropriate action to ensure continued personnel and plant safety. This may include the revoking of the GWP, and work being stopped until a new GWP and appropriate permits are raised.

6.7 Change of Permit Holder

Permit holder should normally be directly in charge of work from start to finish. The work program should be arranged to achieve this whenever possible. However, at times it may be necessary to hand control of work over to another employee or contractor.

Such handing over of responsibility can be the source of errors that can in turn lead to unsafe conditions.
It is therefore important that handovers are undertaken with care and at suitably chosen stages as listed below:

- After verbal approval by Operational Supervisor, who originally authorized the GWP, the worker taking over responsibility is to be fully briefed:
  - on the work,
  - the present status,
  - all hazards,
  - all precautions/ controls (if possible by the present Permit holder).
- The replacement, once satisfied that he/she can safely take over control and that all is in order, is to rule through the original applicants name (it is to remain readable) and append their name beside it on both the original GWP and in the GWP Log. He/she should then counter-sign box (ii).
  - The Supervisor shall be satisfied that the replacement is fully aware of the work and all precautions and controls.
  - Hand-over is finally authorized by the Supervisor initialing against the new applicant's signature on the GWP.

6.8 Hazardous Area Permit

Due to the nature of standing hazards in some areas, special precautions are necessary. There is a requirement to impose certain controls on these areas. The Hazardous Area Permit system ensures that these controls are met during non-routine work. Examples of the hazards to be present in these areas include high voltage power lines, open water, hazardous chemicals, explosives, etc.

The Hazardous Area Permit is designed to ensure that a person with appropriate knowledge and responsibility (the Area Supervisor) is involved in the planning of work within this area, and authorizes entry for work in the area. A copy of the Hazardous Area Permit (*Appendix 4 – Hazardous Area Entry Permit*) is presented at the end of this section.

6.9 Specific Work Permits and Plans

Hot Work Permit

Work that generates heat or sparks is potentially very dangerous, particularly within the type of installation operated by SUPREME ENERGY. See Section …: *Hot Work* for an explanation of the use of the Hot Work Permit and a copy of Hot Work Permit (see *Appendix 5 – Hot Work Permit*) is presented at the end of this section.

Confined Space Entry Permit

Work within a confined space, whether it be a tank, vessel, pipe or sump is potentially very hazardous. See Section …: *Confined Space* for an explanation on the use of the Confined Space Entry Permit, together with a copy of the Confined Space Entry Permit (see *Appendix 6 – Confined Space Entry Permit*) is presented at the end of this section.

Excavations Permit

An Excavation Permit is required for all work involving digging more than a specified depth into the ground or where work is to be carried near to an area prone to slippage. See Section …: *Excavations and Shoring* for an explanation on the use of the Excavation Permit, together with a copy of the Excavation Permit (see *Appendix 7 – Excavation Permit*) is presented at the end of this section.

Mobile Crane Plan

The use of mobile cranes can lead to major hazards that can be difficult to control. Examples of these hazards include crane instability due to ground conditions, damage to underground services and contact with overhead lines. The plan for is designed to help control these hazards. Details of Mobile Crane practices, and the applicable associated permit are address in Section …: *Lifting Equipment and Lifting*.

Scaffolding Plan

Work on or around scaffolding can be hazardous if the scaffolding is not erected correctly. Use of the Scaffolding Plan ensures that suitably qualified personnel are involved in the erection of scaffolding above 5m in height on sites owned and operated by SUPREME ENERGY. Details of safe scaffolding practices, controls, and the applicable associated permit are addressed in Section …: *Working at Height*.

Purge Plan

Purging operations need to be carefully thought through to control the major hazards that are often present. A copy of the Plan form is presented in Section …: *Plant, Systems and Equipment*.

6.10 Changes to GWP Permit

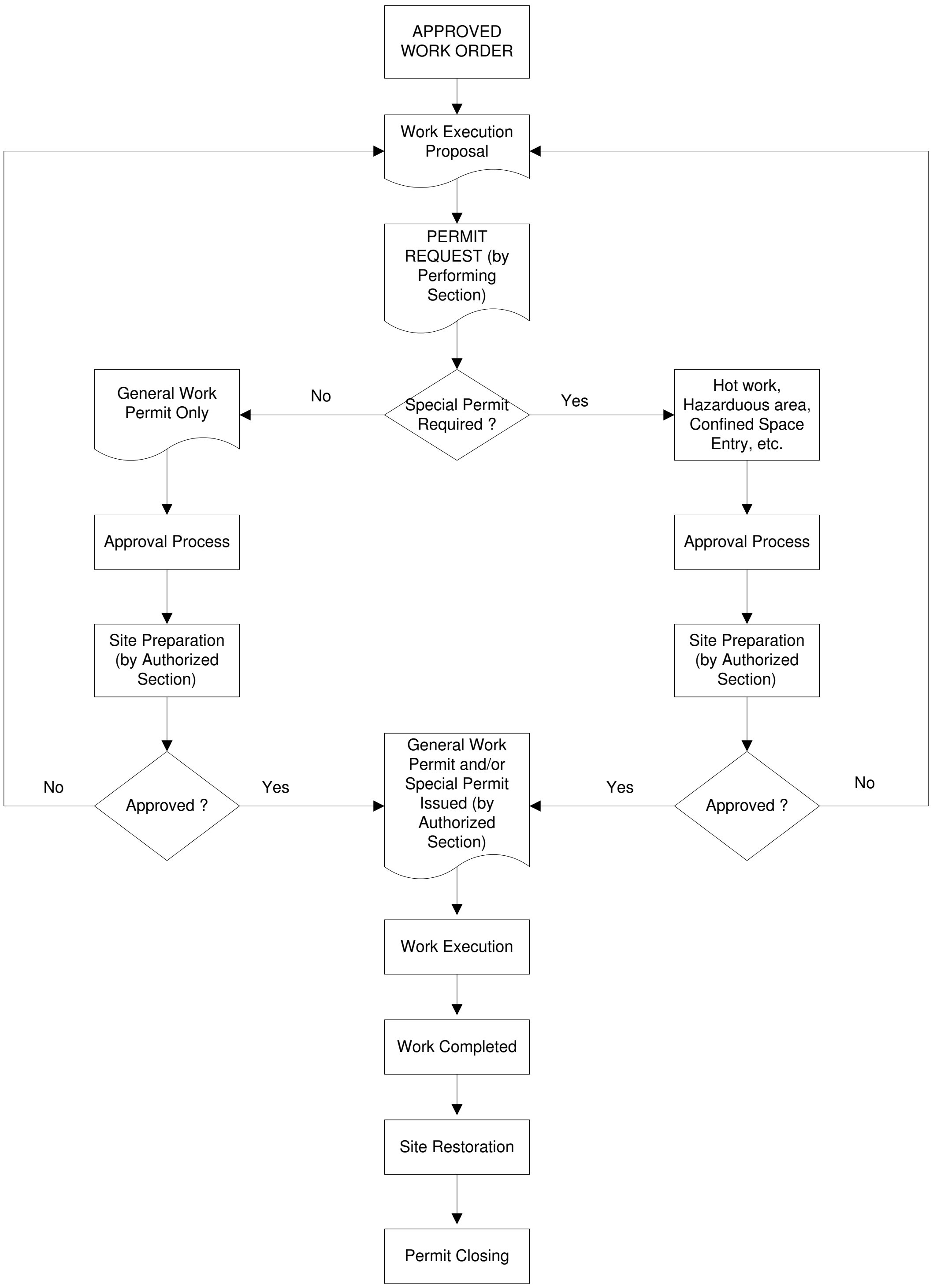
Changes to an existing permit may be necessary for a number of reasons. However, the process of changing the precautions, limitations, or controls put in place by a permit is potentially very risky.

To ensure that the change does not cause an unsafe condition a strict review process is necessary. The Change to Existing Permit (See *Appendix 8 - Change to Existing Work Permit*) aims to ensure the change is planned correctly, all implications have been considered and a review of the proposed changes is carried out by a suitably experienced supervisor.

It is to be used to cover all changes to a General Work Permit, a Hazardous Area Permit or a Specific Work Permit. A copy of the form (See *Appendix 8 - Change to Existing Work Permit*) is presented at end of this section. As the potential for error during a change is significant, this permit is to be produced on yellow paper. It is designed to guide a Permit Applicant through the change process. It is important that whenever possible, the original Permit Applicant completes the change to Existing Permit Form as this person is best placed to understand the work plan, the precautions that were put in place and the implications of the change.

Once completed and authorized the change permit is to be stapled to the original permit and to all copies thereof. The use of yellow paper shall extend to all copies to ensure that the attention of all relevant personnel is drawn to the existence of a change permit.

Appendix 1 – Permit-to-Work Flow Process



Appendix 2 – Permit Request

supreme energy	**PERMIT REQUEST**				
Type of Permit Requested	General	Hot Work	Excavation	Confined Space Entry	Hazardous Area
Ref. Work Order No : _____________	Permit required date : __ / __ / _____		Duration : ________________________		
Area : _________________________	System : ________________________		Location : ________________________		
Effect on Plant, Service or Sites:					
Brief Description of Work :					
Describe any specific operational preparation required : (e.g.. process isolation, draining venting, purging, gas freeing, electrical isolations)					
Requested by : (name & sign)			Date :		

Appendix 3 – General Work Permit

GWP #: - - - - - - -

GENERAL WORK PERMIT

Issue Date : ___________________	Valid from _____________________ (time) Until _____________________ (time)	
Area/Location :	System :	Equipment :

Description of work :

Effect on Plant, Service or Sites :

Nature of hazards:		Precautions			
Stored energy (steam, pressure, electrical)		Isolations in Place		Area Wet	
Noise		Ventilation		Ground Fault Circuit Interrupter	
Toxic substance		Crew Rotation		MSDS available	
Heat		Life Lines Installed		Scaffolding Inspected	
Elevation		Roads Closed		Emergency Station	
Traffic		Mats Installed			
Flammable Vapors		Combustibles Removed			
Ignition Source		Drains covered			
Restricted access		Materials Drained			
Other					

Other Precautions:

Personal Protective Equipment (PPE)

Eye/Ear	Extremities	Fall Protection	Respirator
□□Goggles □□Safety Glasses □□Face Shield □□Earplug □□Muffs	□□Gloves □□Boots □□Hard hat □□Chemical Resistant	□□Harness □□Lifeline	□□SCBA □□Cartridge □□Dusk musk

Other PPE:

Related Specific Work Permit / Certificate

Hot Work Permit	No. #
Confined Space Entry Permit	No. #
Hazardous Area Permit	No. #
Excavation Permit	No. #
Electrical Isolation Certificate	No. #

The location where this work is to be done has been prepared for work, all process isolations are in place, necessary precautions taken, and personnel are aware of their duties, particular hazards and any special precautions and restrictions.
Authorized Person : ________________________ (name) ____________________ (signed) _____________________ (date/time)

I have reviewed and understood all precaution and possible hazards of this work and accepted the condition to commence the work.
Performing Leader: _________________(name) ________________(signed) ____________________ (date/time)

I have reviewed all preparation and method of work and authorized the permit to be issued
Operational Supervisor : _____________________ (name)____________________ (signed) _____________________ (date/time)

This permit is extended from ___________ (time) until ___________ ((time) Authorized Person _______________(signed)

from ___________ (time) until ___________ ((time) Authorized Person _______________(signed)

Work Completion

The work have been completed and work site has been restored and cleaned
Performing Person : ________________________ (name) ____________________ (signed) _____________________ (date/time)

Authorized Person : ________________________ (name) ___________________ (signed)_____________________ (date/time)

Appendix 4 – Hazardous Area Entry Permit

HAEP #: - - - - - - -

HAZARDOUS AREA - ENTRY PERMIT

supreme energy

Issue date :	General Work Permit No. #

Valid from__________________ (time) Until ____________________ (time)

Hazardous Area :

Reason to enter the area :

Nature of hazards to personnel :		Personnel Protection Equipment (PPE) required :
Stored Energy (steam, pressure, electrical)		
Ignition Source		
Flammable material		
Explosive material		
Toxic substances		
Elevation / Depth		
Noise		
Heat		
Dust		
Other		

Specific Precaution :………

The area has been prepared for entry, all necessary process isolations are in place, necessary precautions taken, and personnel are aware of their duties, particular hazards and any special precautions and confirm to be safe for entering. Permission to enter the area is granted.
Authorized Person : ________________________ (name) ______________________ (signed) ______________________ (date/time)

I have reviewed and understood all precaution and possible hazards to enter the area and accepted the condition.
Performing Person : ________________________ (name) ______________________ (signed) ______________________ (date/time)

I have reviewed all preparation and method of work and authorized the permit to be issued
Operational Supervisor : _____________________ (name) ______________________ (signed) ______________________ (date/time)

I understand the entry conditions and all precautions

NAME	SIGNATURE	DATE	IN	OUT	NAME	SIGNATURE	DATE	IN	OUT

PERMIT EXTENSION

This permit is extended from ___________ (time) until ___________ (time) Authorized Person _______________(signed)

from ___________ (time) until ___________ (time) Authorized Person _______________(signed)

WORK COMPLETION

I have confirmed that the work related to this permit have completed. Work area has been cleaned, restored and inspected after the work was completed and were found safe.

Performing Person : ________________________ (name) ______________________ (signed) ______________________ (date/time)

Confirmed that the work have completed and accepted. All safety barriers, signs and any process isolations have been restored.

Authorized Person : ________________________ (name) ______________________ (signed) ______________________ (date/time)

Appendix 5 – Hot Work Permit

HWP #: - - - - - - -

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HOT WORK PERMIT

Issue date :	General Work Permit No. #

Valid from ______________________ (time) Until ______________________ (time)

Area/Location :	System :	Equipment:

Description of work :

Ignition Source(s):

Atmospheric Testing Certificate No. #	Result :

Hazards	Y	N	Precautions	Y	N
Ignition source within 12 meter of fuel source			Charged Fire Hose		
Open drains with Hydrocarbons			Shields, Blankets		
Combustibles in the Area			Drains covered		
Non Intrinsically Safe (IS)			Area Wet		
Welding process			Fire Extinguisher		
Compressed Gas Cylinders			Ventilation		
Radiation			Welding Machine Grounded		
			Welding Equipment Inspected		
			Cylinders secured		
			Continuous Atmospheric Monitoring		

Other Specific Precaution:

The location where this work is to be done has been examined, necessary precautions taken, and personnel are aware of their duties, particular hazards and any special precautions.
Permission is granted for this work.
Authorized Person : ________________________ (name) ______________________ (signed) ______________________ (date/time)

I have reviewed and understood all precautions and possible hazards of this work and accepted the conditions to commence the work.
Performing Leader : ________________________ (name) ______________________ (signed) ______________________ (date/time)
Fire Watcher : ________________________ (name) ______________________ (signed) ______________________ (date/time)

I have reviewed all preparations and methods of work and authorized the permit to be issued
Operational Supervisor : ______________________ (name) ______________________ (signed) ______________________ (date/time)

PERMIT EXTENSION

This permit is extended from ___________ ((time) until ___________ (time) A.P. _______________(signed)

from ___________ (time) until ___________ (time) A.P. _______________(signed)

WORK COMPLETION

I have confirmed that the work related to this permit has been completed. Work area has been cleaned and restored, all adjacent areas to which sparks and/or heat might have spread (including floors above and below and opposite side of walls) were inspected for 30 minutes after the work was completed and were found safe.

Performing Person : ________________________ (name) ______________________ (signed) ______________________ (date/time)

Confirmed that the work has been completed and accepted. All safety barriers and signs have been restored.

Authorized Person : ________________________ (name) ______________________ (signed) ______________________ (date/time)

Appendix 6 – Confined Space Entry Permit

CSEP #: - - - - - - -

CONFINED-SPACE ENTRY PERMIT

Issue date :			General Work Permit No. #	
Valid from _____________________ ((time) Until _____________________ ((time)				
Description of confined space :				
Reason for entry :				
Atmospheric Testing Certificate	No. #			
Is Hot work allowed?	Yes	No	Hot Work Permit #	
Process Isolations : (/or P&ID as necessary to list all process isolations)				

Blind Flanged Installed		Spool Pieces/Valve Removes	

Entry Preparations

Description of hazards	Yes	No	Description of Preparations	Yes	No
Hazardous residue present			Vacating / Draining / Venting		
Physical Stress (Heat/Cold)			Flushing / Purging		
Oxygen Deficiency			Area Barricaded		
Noise			Continuous atmospheric testing and ventilation		
Combustible gas/vapors			Lighting		
Toxic gas/vapors (H_2S)			Life lines		
Chemical contact			First Aider and equipment		
Electrical/Mechanical			Communication Plan Made		

The location where this work is to be done has been prepared for entry, all process isolations are in place, necessary precautions taken, and personnel are aware of their duties, particular hazards and any special precautions and confirm to be safe for entry.

Authorized Person : _______________________ (name) _______________________ (signed) _____________________ (date/time)

I have reviewed and understood all precaution and possible hazards of this work and accepted the condition to commence the work.

Performing Person : _______________________ (name) _______________________ (signed) _____________________ (date/time)

Entry Attendant : __________________________ (name) _______________________ (signed) _____________________ (date/time)

I have reviewed all preparation and method of the work and authorized the permit to be issued

Operational Supervisor : _____________________ (name) _______________________ (signed) _____________________ (date/time)

Permit Extension

This permit extended from _______________ (date) _______________ (time) Until _______________ (time)

Work Completion

I have confirmed that the work related to this permit have completed. Work area has been cleaned, restored and inspected after the work was completed and were found safe

Performing Person : _______________________ (name) _______________________ (signed) _____________________ (date/time)

Confirmed that the have completed and accepted. All safety barriers, signs and process isolations have been restored.

Authorized Person : _______________________ (name) _______________________ (signed) _____________________ (date/time)

I understand the entry conditions and all precautions

ENTRANT NAME	SIGNATURE	DATE	Entry Time	Exit Time

Continue in separate paper

Appendix 7 – Excavation Permit

EP #: - - - - - - -

supremeenergy

EXCAVATION PERMIT

Issue date :	General Work Permit No. #

Location to be excavated :

Reason for excavation :

I have review the excavation plan and confirm that is safe for excavation work.

Electrical Engineer : ____________ (name) ____________ (sign) ____________ (date)

Mechanical Engineer : ____________ (name) ____________ (sign) ____________ (date)

Specific Precaution :

The area has been reviewed, necessary precautions taken, particular hazards and any special precautions has been addressed. Confirm to be safe for excavation work. Permission is granted.
Authorized Person : ____________ (name) ____________ (signed) ____________ (date/time)

I have reviewed and understood all precaution and possible hazards in the area and accepted the condition.
Performing Person : ____________ (name) ____________ (signed) ____________ (date/time)

I have reviewed all preparation and method of work and authorized the permit to be issued
Operational Supervisor : ____________ (name) ____________ (signed)____________ (date/time)

Appendix 8 - Change to Existing Work Permit

<table>
<tr><td colspan="2">General Work Permit# ______________ Dated: ___________________

Change # _________________________ Dated: ___________________</td></tr>
<tr><td colspan="2">Reason for Change:</td></tr>
<tr><td colspan="2">Details of Change</td></tr>
<tr><td colspan="2">Addition Precautions</td></tr>
<tr><td>Change Planned and Checked</td><td>Permit Holder</td></tr>
<tr><td>Change Authorized</td><td>Operational Supervisor</td></tr>
</table>

Appendix 9 – Atmospheric Testing Certificate

ATC #: - - - - - - -

supreme energy	**ATMOSPHERIC TESTING CERTIFICATE**	
Date :		Time :
Area/Location :	System :	Equipment :
Reason for testing :		
RESULT		
Oxygen Content : ________ %	Toxic Gas : ___________ PPM	Flammable Gas : _____%LEL
(Other) ____ : _____________	(Other) ____ : _____________	(Other) ____ : ___________
Remarks :		
Continuous Atmospheric Monitoring	Yes	No
Re-commended re-testing every : ___________ hours / minutes		
Authorized Gas Tester : Name : _________________ (Signed) : _______________ (Date) : _________ (Time) : ____________		

RE-TESTING RESULT

Date	Time	Oxygen	Toxic (. . . .)	%LEL	Other	By (name, signed)	Remarks

Appendix 10 – Electrical Isolation Certificate

EIC #: - - - - - - -

supreme energy	**ELECTRICAL ISOLATION CERTIFICATE**	
Date :		
Area/Location :	System :	Equipment :
Equipment Tag No :		
CB No :		
Reason for Electrical Isolation :		
POWER RE-INSTATEMENT		
Confirmed that all related works have been completed, and safe to re-instate the electrical power. Requested by : ________________ (name) ________________ (signed) ________________ (date) ______________ (time)		
I have checked the condition and it is safe to re-instate the power for the equipment stated above. *Electrical Power was re-instated by :* ____________________ (name) ________________ (signed) ___________________ (date) __________________ (time)		

ELECTRICAL ISOLATION
Please isolate the electric power from the equipment stated above Requested by : ________________ (name) _________________ (signed) ________________ (date) ______________ (time)
Confirmed that electrical isolation has been carried out to the equipment stated above *Electrical Power was isolated by :* ____________________ (name) _________________ (signed) ___________________ (date) __________________ (time)

supremeenergy	SAFETY. HEALTH & ENVIRONMENT WORK RULES	PROCEDURE
CORPORATE	LIFTING & LIFTING EQUIPMENT	SE-MSHE-WOR-PRO-0009 Revision: 0

APPROVAL

	POSITION	NAME	SIGNATURE	DATE
Prepared by	SHE Engineer	Erwin Patrisa Floris		
Reviewed By	Sr. SHE Manager	M. Arief Tarunaprawira		
Approved By	VP Relations & SHE	Priyandaru Effendi		**19/06/2013**

REVISION HISTORY

REV	DATE	BY	REVIEWED	APPROVED	DESCRIPTION
0					For Use

TABLE OF CONTENTS

1 INTRODUCTION

This section describes SUPREME ENERGY (the Company) Safety guidance for all those personnel having responsibility for safety in the selection and use of lifting plant and equipment.

Various types of lifting equipment are used within the Company for lifting and moving the materials critical for conducting our day-to-day activities. In order to maintain a high level of safety where lifting equipment are used, a comprehensive process is necessary for managing their operation, including training and qualifying operators, preventive maintenance and inspections.

This document provides guidance for instituting such a system. It identifies management, supervisor and employee responsibilities and provides information for determining the appropriate qualifications for lifting equipment operators. It also provides important information for planning non-routine lifts. Additionally, this guideline includes basic safe operating practices, and inspection and maintenance requirements. Lastly, information is provided to facilitate the selection, use, inspection, and storage of rigging equipment.

It is not possible in a document of this nature to cover every lifting application in detail. However, it is anticipated that most problems can be settled by reference to the principles contained within this document.

2 GENERAL LIFTING

2.1 DEFINITIONS

Lifting Appliance
Any machine other than a crane used to raise or lower a load, but does not include a conveyor, elevator or an excavator handling soil, aggregate, mineral or a like substance.

Load Indicating Device
A device that measures and displays the weight of load being lifted or force being applied.

Minimum Breaking Load (MBL)
The maximum certified test load that the rope will carry without parting.

Qualified Person
A person who, by possession of a recognised degree, certificate or professional standing, or who by knowledge, training or experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the subject.

Safe Working Load (SWL)
The maximum rated load which can be safely handled by a machine under specified conditions.

2.2 LIFTING

- All personnel involved in lifting of any kind shall have the required skill, knowledge, experience and qualifications for the task being performed.
- Before starting any lift, the weight to be lifted, together with the lifting tackle to be used shall be determined.
- Lifting areas must be properly lit for safe handling of the load.
- Unless unavoidable, personnel shall never walk or stand under suspended loads and, as far as possible, all personnel shall keep clear of the area of operations.
- Particular care shall be used in moving or lifting heavy equipment especially around pressure vessels, lines, and wells. It may be necessary, or required, to shut in or bypass a system where such lifts are made.
- Chains are not allowed for lifting activities, except for chain hoist / chain block use. Refer to *19.8 Chain Hoist*.

2.3 USE OF LIFTING EQUIPMENT

- No lifting gear is to be used unless it is certified to be safe by an appropriate Indonesian authority.
- New or serviced items shall not be used unless a test certificate has been received.
- Lifting equipment out of its statutory life is not to be used.
- No lifting equipment is ever to be loaded above its SWL, except for the purpose of proof testing.
- If a lifting appliance is fitted with a SWL indicator, or alarm, this shall not be disconnected at any time while the equipment is in service.
- All items of lifting equipment shall be clearly marked (die stamped if possible) with its SWL and identification number.
- Those parts of lifting appliance wire-lines which are liable to suffer wear or deterioration are to be examined at intervals of 7 days.
- When lifting gear is damaged or worn beyond repair, it shall be destroyed in such a fashion as to be rendered useless. Records shall be adjusted and the test certificate cancelled.

2.4 EXAMINATION AND TESTING OF LIFTING EQUIPMENT

- All lifting gear and appliances shall be examined and tested to the requirements of the relevant statutory legislation.
- Details of all examinations and tests are to be recorded in the official register and be available, along with test certificates, for inspection.

3 CRANES

3.1 DEFINITIONS

Crane
Any appliance equipped with mechanical, hydraulic, pneumatic or electrical means for raising and lowering a load by ropes or slings and transporting the load while suspended. It includes all ropes, slings, shackles, swivels, rings, hooks, or other tackle used in the operation of a crane but does not include:

- a hoist block running on a fixed rail or wire
- a stacker or conveyor whereby a load is moved by means of a belt or platform
- an earth moving or mineral moving or excavating appliance not fitted with a grab.

Crane Operator
A person who through training and experience is assessed as competent to operate a particular make and model of crane and holds a valid certificate.

Dogman/Pilot
A person who through training and experience is qualified to sling loads and direct the lifting and placing operations of a crane.

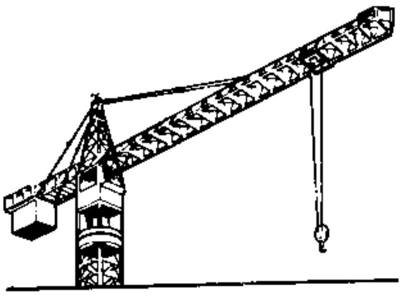
Safety Ropes or Boom Arresters
Ties fitted between the underside of the boom to a fixed part of the crane to prevent whip back. Safety ropes may also be fitted between the underside of a fly jib and boom.

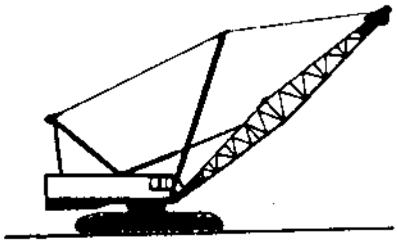
3.2 CRANE OPERATION

- All cranes shall be operated by a trained and certified operator. They shall be operated within the scope of their rating, and shall be maintained in good order and condition at all times.
- Before any crane is used, it shall have a valid test certificate or be in date for test.
- Immediately before being put into use after installation, re-installation, substantial alterations or repair, or at maximum intervals of 1 year, the crane must be re-tested. The person shall not be an employee of the company.
- A check is to be completed at the commencement of each shift. The check is to cover cables, fittings, drums, dog brakes, boom, hooks and guards. Limit switches are to be tested to ensure that they are working correctly. Sheaves and other rotating parts are to be greased on a regular basis as recommended by the manufacturer.
- Crane safety load indicators and alarms shall be inspected and tested at intervals of seven days.
- A table showing the SWL and radius limitations of the crane shall be prominently displayed in the crane cabin. The table shall take into account the

number of lines that are being used with regard to concluding the SWL. For any change of boom length the table shall be changed to clearly show the new SWL and radius limitations.

- The crane operator shall be advised of the weight of each load to be lifted.
- The crane boom and hook shall be safely secured before the operator leaves the crane.
- Cables on the drum are never to be run off to less than two remaining turns.
- Crane activities shall stop in the event of a potentially dangerous situation.
- Crane hoisting mechanisms shall never be used for any purpose other than lifting or lowering.
- No crane operation will take place without an appointed 'dogman', and an adequate system of communication between the 'dogman' and the crane operator being established (see the hand signals shown in section 3.7).

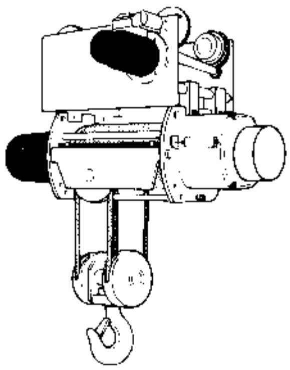




Tower Crane Track Crane

All Terrain Cran

Mobile Crane All Terrain Crane



Gantry Crane

Figure 19.1: Types of Crane

3.3 TRAINING AND QUALIFICATION FOR CRANE DRIVING

- No person under the age of 18 years shall drive or operate a crane.
- Cranes are only to be operated by persons who have been trained and qualified to an appropriate level.
- Only personnel with good sight (corrected with spectacles if necessary) and good hearing are to be selected as crane drivers.

3.4 OPERATOR'S RESPONSIBILITIES

Teamwork in cranage is essential. In order to achieve this, there must be on-going communication between all involved in crane operations. Operators shall:

- operate the machine safely
- operate the crane or lifting appliance in accordance with the manufacturer's instructions and within its safe working load (SWL)
- not interfere with or disconnect any limiting or safety device intended for the safe operation of the crane or lifting appliance
- not continue to lift a load which causes the safe load indicators to alarm
- report any defect in their crane or lifting appliance to their supervisor
- carry out each lift in a safe and efficient manner
- beware of hazards in the vicinity of the lifting operation.

3.5 LOADS

- Whenever loads are being handled, the operator shall be alert to the potential hazards involved. Some of the more obvious points that operators must take into consideration, include:
  - crane or lifting appliance capacity rating, at required position
  - the weight of each load to be handled
  - the safe working load of any rope, sling or shackle used.
- All loads shall be secured to prevent slipping or displacement. The security of each load shall be checked after it has been raised a few centimetres.
- Loads shall never be left suspended if the crane is unattended.

3.6 SAFETY DEVICES

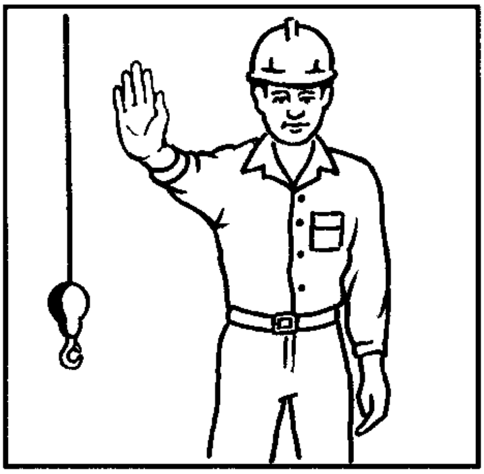
All safety devices provided on cranes which indicate an unsafe or an overload condition shall be kept in first-class working order and shall be tested at least once a week. The adjustments are to be in the right range and the device in good working order. These tests are to be recorded.

3.7 SIGNALLING

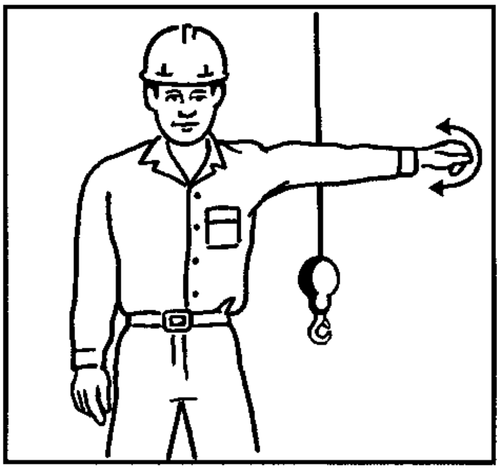
Signalling to operators shall be done in accordance with recognised standards, and then only by persons who have the required knowledge and experience and are fully conversant with the operation.

- The signaller shall stand in a secure position where they can see the load and can be clearly seen by the driver.
- The signaller shall face the driver if possible.
- Each signal shall be distinct and clear.

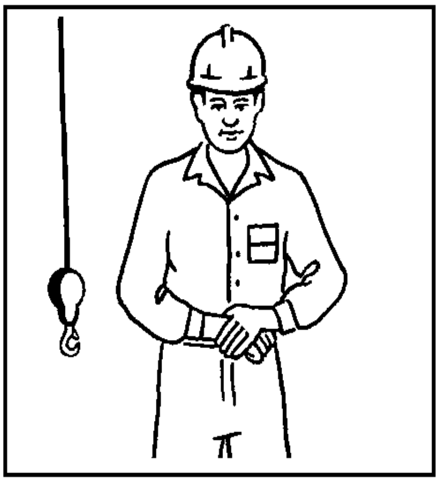
Illustrations that show recommended crane signals are included on the following pages.



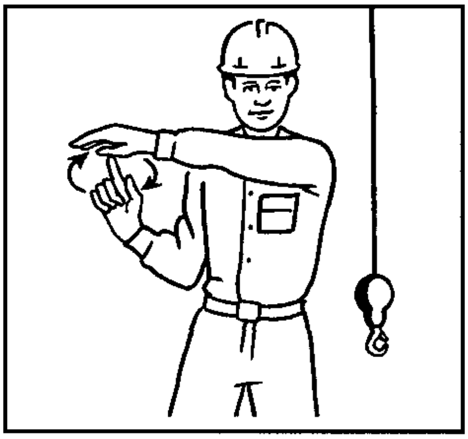
STOP A. Extend one arm forward. **EMERGENCY STOP** is indicated by extending both arms.



STOP B. Arm extended, palm down, move hand right and left. Usually for tower crane operation.

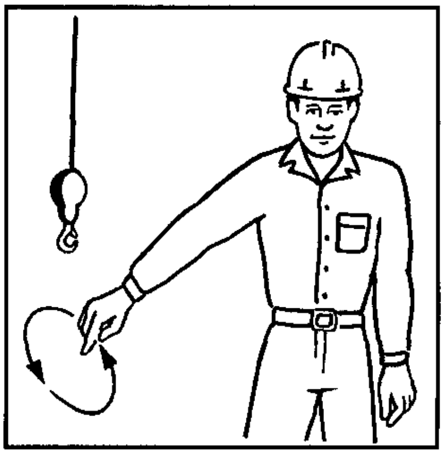


HOLD EVERYTHING. Clasp hands in front of body.

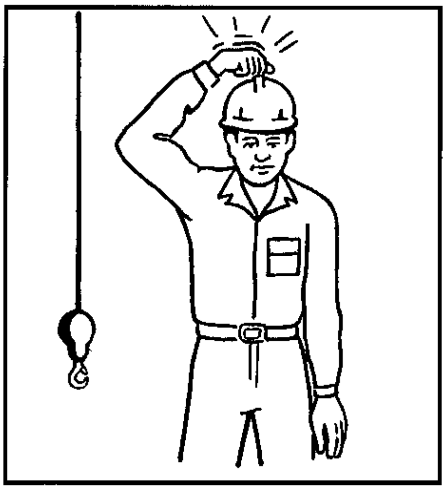


MOVE SLOWLY. Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (HOIST SLOWLY shown as example.)

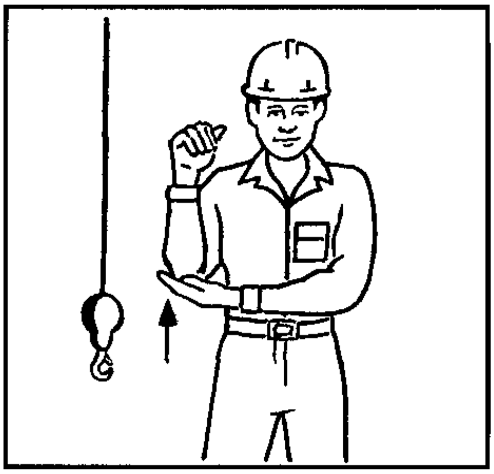
HOIST. With forearm vertical, forefinger pointing up, move hand in small horizontal circles.



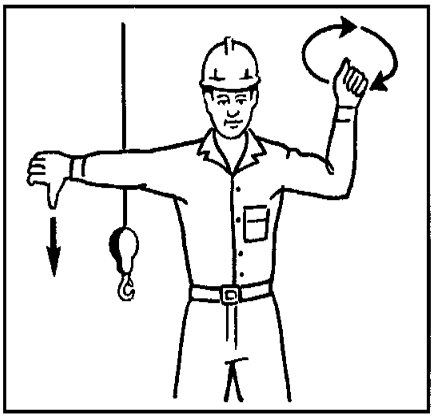
LOWER. With arm extended downward, forefinger pointing down, move arm in horizontal circles.



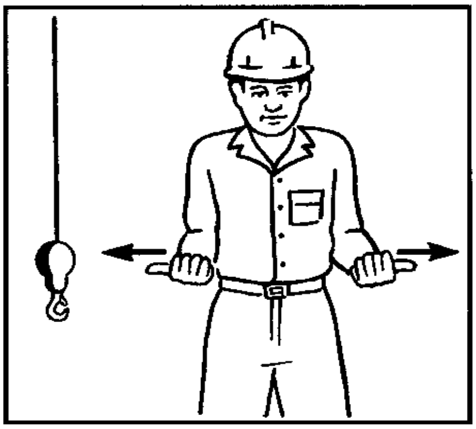
USE MAIN HOIST. Tap fist on head, then use regular signals.



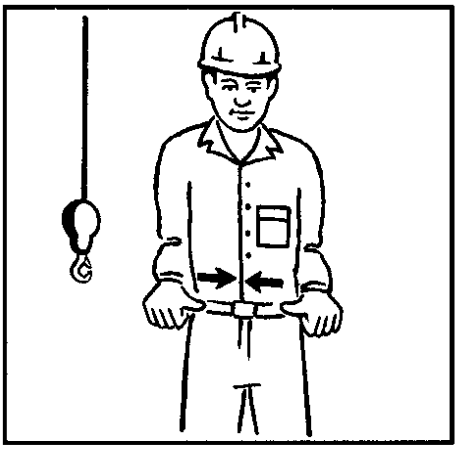
USE FLYLINE (auxiliary hoist). Tap elbow with one hand, then use regular signals.



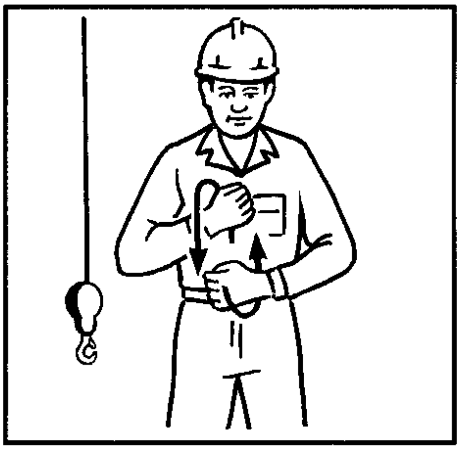
LOWER THE BOOM AND RAISE THE LOAD. Right arm extended, thumb pointing down and left forearm and forefinger vertical, move left hand in small horizontal circles.



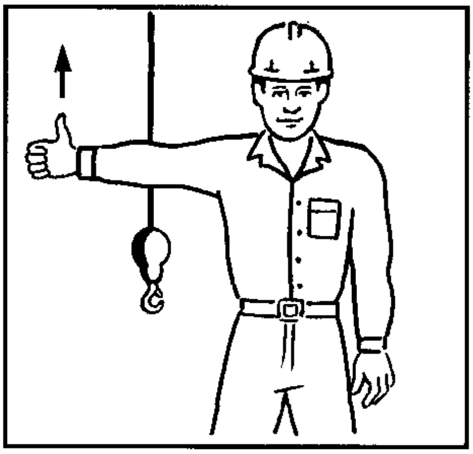
TROLLEY OUT or EXTEND BOOM. Both fists in front of body with thumbs pointing outward.



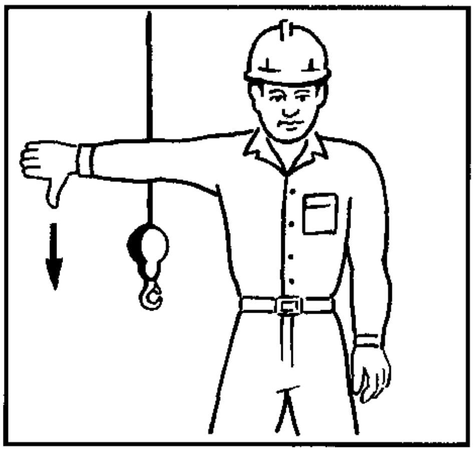
TROLLEY IN or RETRACT BOOM. Both fists in front of body with thumbs pointing toward each other.



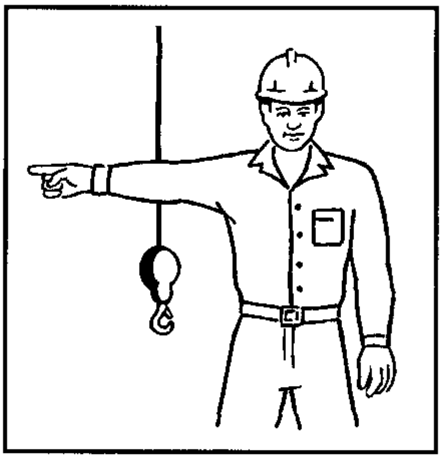
TRAVEL. Arms each bent at elbows, fists clenched, rotate both forearms around each other. Then point in the direction of travel.



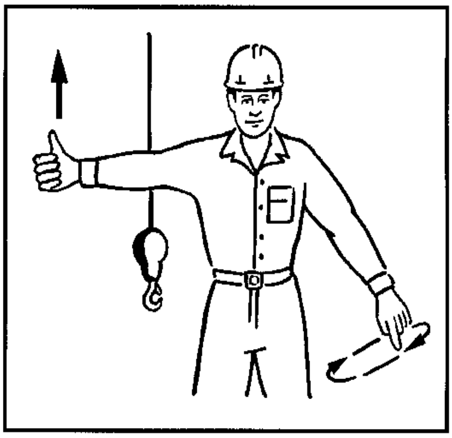
RAISE BOOM (luff up). Arm extended, fingers closed, thumb pointing upward.



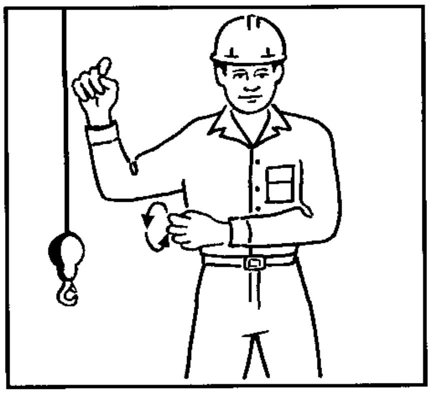
LOWER BOOM (luff down). Arm extended, fingers closed, thumb pointing downward.



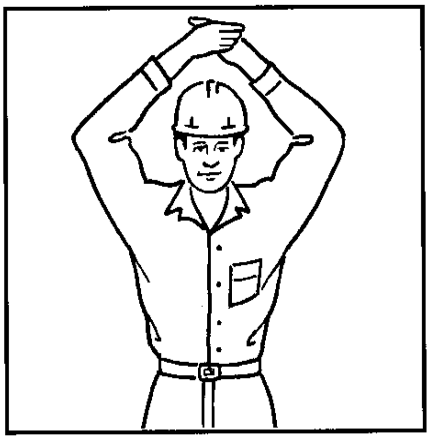
SLEW. Arm extended, point with finger in direction of swing of boom.



RAISE THE BOOM AND LOWER THE LOAD. Right arm extended, thumb pointing up, left arm extended downward swinging in horizontal circles.



TRAVEL (one track). Lock the track on side indicated by raised fist. Travel opposite track in direction indicated by circular motion of other fist rotated vertically in front of body. (For crawler cranes only.)



FINISHED WITH CRANE. Place arms above head and cross arms.

3.8 MOBILE CRANES

- A ‘mobile crane plan’ shall be completed prior to using a mobile crane at the site.
- Where outriggers are fitted to wheels of cranes, they shall be fully extended and firmly jacked before lifting operations commence.
- Only cranes specifically designed for the purpose shall be used to transport loads. The hoisting mechanism of a crane shall not be used for any other purpose than lifting or lowering the load vertically.
- Hooks shall be properly and safely secured while the crane is in transit, with the jib in the ‘shut-down’ position.

3.9 GANTRY CRANES

- Warning notices shall be posted in prominent positions, especially at access points, to indicate that a crane operates in the area.
- An audible warning device must operate whenever a gantry crane is in use or tracking.
- No work may be carried out on or near the crane tracks or in way of the crane’s travel, until the crane has been rendered inoperable by electrical isolation.

3.10 MULTI-LIFTING

Multi-lifting is a hazardous operation that requires close team work between operators, dogman, and machines.

The following rules must be observed:

- A detailed work method statement is to be prepared and checked before the work is carried out. This statement should include the duties and responsibilities of all personnel involved and the safe practices to be followed.
- Operators and dogman shall be experienced, not trainees unless under the direct supervision of an experienced person.
- The multi-lift is to be under the direction of one experienced person.
- Directions between dogman and operators may be direct line of sight using signals (set out above) or by two-way radio or telephone with a dedicated channel.
- It is recommended that the crane safe working load (SWL) ratings be reduced by 25% on each crane.
- The weight of the lift shall be made known to all involved.
- Where cranes are used to lift a load beyond their individual capacity, the load should be distributed between each crane - equalising tackle.

- Each crane shall be set up level and stable.
- Throughout the lifting operation, the hoisting ropes shall be vertical.
- Where practicable, a trial lift shall be made.
- All lifting equipment shall be certified, checked and any faulty equipment discarded from use.

NOTE: While it is accepted that there are some lifts that can only be carried out using more than one crane, it is not a work practice that is recommended.

3.11 SNAGGED OR STUCK LOADS

Any load that may overload a crane even though the weight is less than its SWL, due to vacuum or bonding between load and/or support should be wedged or levered free. Never try to free a snagged or stuck load by slewing line. Beware of exceeding the safe working load (SWL) when trying to free a stuck load.

3.12 TAG LINES

Where there is a likelihood of load-spin, tag lines should be attached and used (see Figure 19.19).

3.13 WIND CONDITIONS

Consideration needs to be given to wind speed prior to undertaking any lift. Loads with large surface areas can be hazardous, as the wind may cause the load to spin, resulting in loss of control.

3.14 CRANE-LIFTED WORK PLATFORMS

The use of a crane to suspend a working platform is restricted to work that cannot reasonably be carried out safely by other means. Conditions that apply to the use of a crane-suspended working platform are listed below:

- The working platform shall be certified as safe by an appropriately qualified person.
- The occupied platform shall be raised and lowered under power. Free fall is not permitted.
- The crane operator shall have had at least 80 hours safe operating experience on the machine being used.
- The operator shall remain at the controls at all times when the platform is in use.
- The perimeter of the work platform shall be fitted with sides or guard rails, mid-rail and toe boards.
- The platform's weight and safe working load shall be clearly displayed on the platform and not exceeded.

- All shackles shall be moussed and the hook shall have a safety latch.
- Personnel working from the platform shall wear a safety harness attached to a suitable independent point and/or line.

3.15 CRANE-HOISTED PERSONNEL BASKETS

Personnel working in or working from personnel baskets shall wear a safety harness and have their lanyards secured while aloft. Refer to Section…: *Working at Height*.

The use of a crane to suspend a personnel basket is restricted to work that cannot be carried out safely by other means.

4 RIGGING

4.1 RIGGING OF LOADS

- All slinging of loads shall be done by experienced personnel and care must be taken in assessing the correct weight, the load, and the correct size of slings required.
- All ropes, slings and lifting tackle shall be free of any obvious defects, shall be of adequate strength, shall be constructed of sound material, and shall be maintained in good order and condition.
- Slings and lifting tackle shall be examined as required by the manufacturer's instructions and records kept of all examinations.
- Any defective items shall be removed from use.

4.2 FACTOR OF SAFETY

This is the ratio of the load that would cause failure of a member or structure to the load that is imposed upon it in service. Unless otherwise prescribed, the factor of safety should be a minimum of 3.

Table 4.1: Lifting Equipment Factors of Safety

Lifting Equipment	Required Factor of Safety
Wire Rope	5
Hand Haulage Fibre rope	6
Electric and air operated hoists	10
Webbing Slings	6
Shackles	4

4.3 SAFE WORKING LOAD (SWL)

This is the maximum load calculated in accordance with sound and accepted engineering practice taking account of the appropriate safety factors identified in Section 19.4.2, that can be supported safely under normal working conditions.

- The safe working load (SWL) of each sling shall be clearly identified by user.
- The SWL must not be exceeded.
- Slings should always be used as near vertical as possible.

On two leg slings, always be aware of the changing SWL factor with changing angles of the sling. In general if L is greater than S, as shown in Figure 19.3, then slinging is acceptable. Refer to Section 19.4.5 for more details on slinging methods and sling angles.

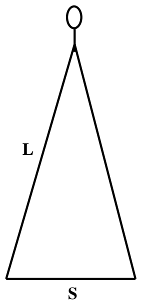


Figure 19.2: Sling Ratio

4.4 SAFE USE OF SLINGS

The basic objective of good slinging practice is to ensure that the load is safe and, when slung, is as secure in the air as it was on the ground. The basic principles are listed below:

- The sling and its method of use shall be suitable for the load.
- The method of attachment of the sling to the load and the sling to the lifting appliance shall be secure.
- No part of the sling shall be overloaded either by the weight of the load or the method of slinging
- The slinging method shall ensure that the load is secure and the load will not fall from the sling
- The load shall be balanced and stable so that it cannot violently change its attitude when lifted.
- The load shall not be damaged by, or cause damage to, the sling.

4.5 METHODS OF SLINGING

Slings can be used in a variety of ways according to the requirements of the job. The lifting capacity or sling safe working load (SWL) required, is calculated by:

- determining the weight of the load to be lifted
- determining the slinging method ensuring that restrictions of the sling-load connection / attachment method (Section 19.4.6) are met
- adjusting the SWL of the slings for the chosen slinging method as per this section
- adjusting the required sling SWL by the sling-load connection/attachment rating (column 3 of Table 19.2) by multiplying the sling SWL by the rating of the chosen attachment method.

4.5.1 Two-Leg Sling

A two-leg sling comprises of two legs permanently connected at their upper ends by a suitable ring or link and marked as an assembly. Two-leg slings may be used to handle a wide range of loads. (See figure 19.3)

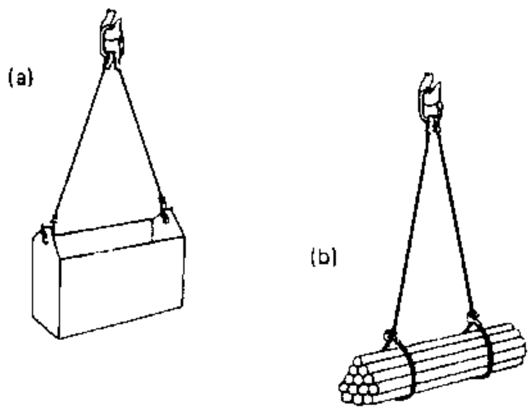


Figure 19.3: Two-Leg Slings

Where the included angle between legs is from 0^o to 90^o, or each sling leg is not more than 45^o to the vertical, the safe load limit of the two leg sling assembly is calculated by multiplying the SWL of one sling leg by 1.4, i.e. SWL x 1.4 = safe load limit of the two leg sling assembly.

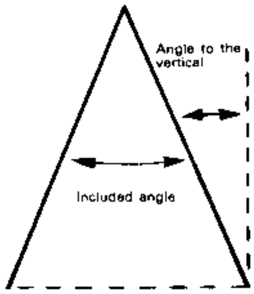


Figure 19.4: Diagram Showing Restriction Angles for Two Leg Slings

4.5.2 Three-Leg Sling

A three-leg sling comprises three legs permanently connected at their upper ends by a suitable ring or link assembly and marked as an assembly. Three-leg slings are commonly used to handle circular or irregularly shaped loads where the legs can be equally spaced. (See figure 19.5)

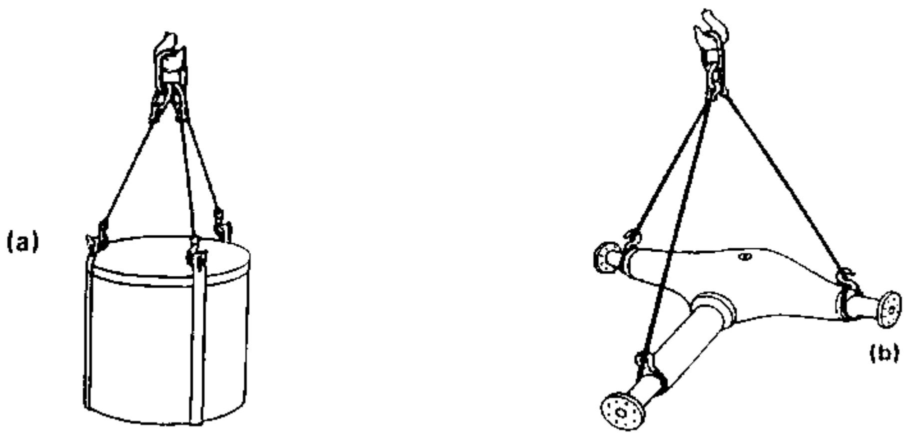


Figure 19.5: Three-Leg Slings

Where the maximum included angle between any leg and vertical is not greater than 45^{o}, the safe load limit of the three leg sling assembly is calculated by multiplying, the SWL of one leg by 2.1, i.e. SWL x 2.1 = safe load limit of the three leg sling assembly.

Where the maximum included angle between any leg and vertical is greater than 45^{o}, but not more than 60^{o}, the safe load limit of the three leg sling assembly is the SWL of one leg multiplied by 1.5, i.e. SWL x 1.5 = safe load limit of the three leg sling assembly.

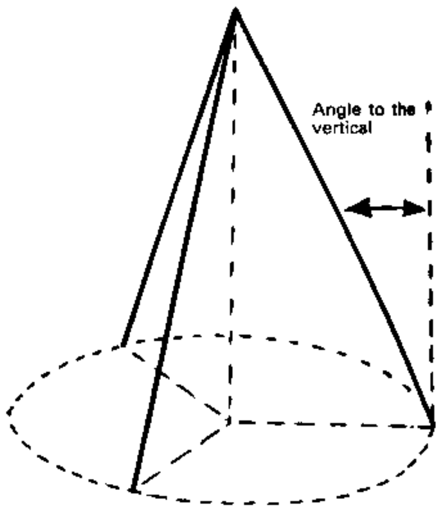


Figure 19.6: Diagram Showing Restriction Angles for Three Leg Slings

4.5.3 Four-Leg Sling

A four-leg sling comprises four legs permanently connected at their upper ends by a suitable ring or link assembly and marked as an assembly. Four-leg slings are mainly used to handle square or rectangular (four cornered) loads. (See Figure 19.7).

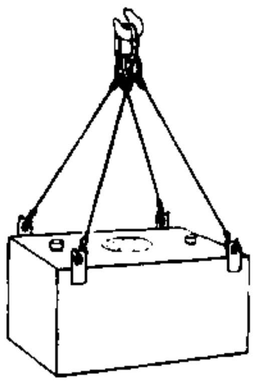


Figure 19.7: Four-Leg Sling

Where the maximum included angle between either set of two diagonally opposite legs is not greater than 90^o or the maximum angle between any one leg is not greater than 45^o to vertical, the safe load limit of the four leg sling assembly is the SWL of one leg multiplied by 2.1, i.e. SWL x 2.1 = safe load limit of the four leg sling assembly.

Where the maximum included angle between either set of two diagonally opposite legs is between 90^o and 120^o, the safe load limit is the SWL of the four leg sling assembly of one leg multiplied by 1.5, i.e. SWL x 1.5 = safe load limit of the four leg sling assembly.

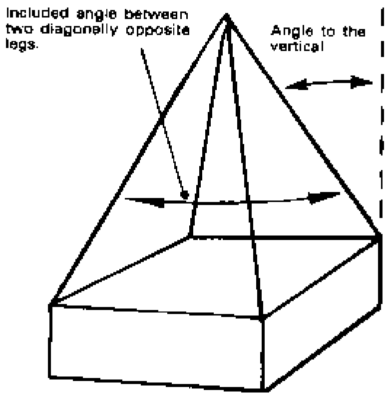


Figure 19.8 : Diagram Showing Restriction Angles for Four Leg Slings

4.6 METHODS OF SLING ATTACHMENT

4.6.1 Endless Slings

Endless slings are generally used in a choke hitch (see figure 19.9) and may need derating as recommended by relevant standards or the manufacturer or supplier. (Also, refer to Table 19.2: Sling Load Connection/Attachment Rating Chart.)

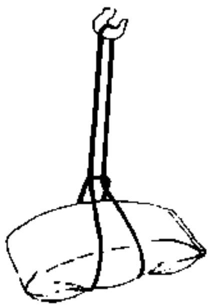


Figure 19.9 Endless sling

4.6.2 Straight-Leg Slings

A single or multi-leg sling may be used with the legs straight if, for example, the legs are terminated in hooks which can be attached directly to a suitable lifting point on the load.

4.6.3 Choke Hitch

Single-leg or multi-leg slings may both be used in choke hitches. The basic advantages of a choke hitch are firstly that a sling may be attached to a load which has no suitable lug or eye bolt etc. and secondly, that the sling tends to bind the load together.

A choke hitch using a hook is sometimes known as ‘snickling’.

In forming a choke hitch, the sling is bent round a small diameter which may be the eye of the sling itself or the saddle of a hook or other fitting. In these circumstances, the load in the sling will be increased at the point of choke and for this reason some derating may be necessary in order to prevent the sling being locally overloaded. For instance, for fibre rope slings and webbing the safe working load should be reduced to 0.8 of the safe working load of the straight leg (refer to Table 19.2: Rating Chart).

4.6.4 Double-Wrap Choke Hitch

A double-wrap choke hitch is a variation on a choke hitch where the sling is passed one complete turn around the load before being choked. This increases the binding effect and should be used on loose loads such as bundles of tubes.

The sling shall be derated by the same amount as for an ordinary choke hitch.

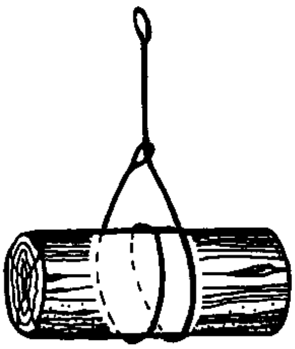
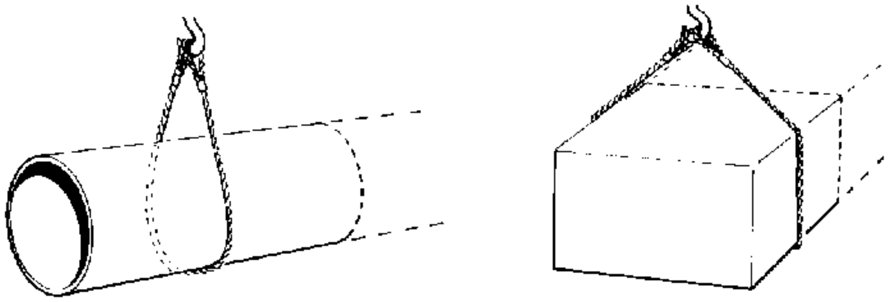


Figure 19.10: Double-Wrap Choke Hitch

4.6.5 Basket Hitch

The basket hitch is normally used with slings in pairs for handling loads such as a large roller but it is not suitable for cradling loose bundles. If only one sling is used, the sling shall be passed through the load at a point above the centre of gravity to ensure it is safely secured.



The use of two hooks is necessary for stability of basket hitches

Figure 19.11: Basket Hitch

If a sling in basket hitch is used with both legs parallel, i.e. with an included angle of 0^o between the legs of the basket, then twice the safe working load of the sling may be lifted.

With the terminations of both ends of the sling on the hook the load lifted may be increased to not more than 1.5 times the safe working load of the sling provided the included angle does not exceed 90^{o}.

If two slings are used in basket hitch in the same manner the load may be increased to 2.0 times the safe working load of the sling, again provided that no included angle between adjacent or diagonally opposite legs exceed 90^{o}. The above factors for basket hitches assume that all sharp edges are adequately packed.

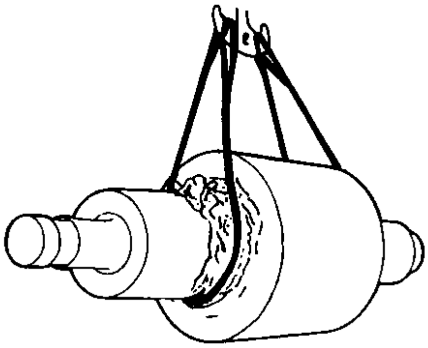


Figure 19.12: Two Sling Basket Hitch

4.6.6 Double-Wrap Basket Hitch

In double-wrap basket hitch the sling is passed completely around the load. This will help to ensure the security of loose bundles. If security of the load is the prime consideration, then a double-wrap choke hitch is recommended. The factors are the same as for a basket hitch.

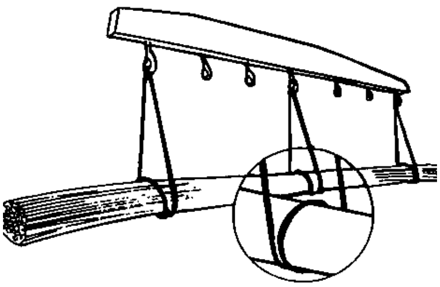


Figure 19.13: Double -Wrap Basket Hitch

4.6.7 Double and Choke Hitch

The double and choke hitch is a variation of a choke hitch where the load is carried on two parts and for this reason the safe working load in the choke hitch may be varied in accordance with the manufacturer's or supplier's advice.

Where this is not available, the single choke hitch rating shall be used. This is sometimes known as ‘halshing’.

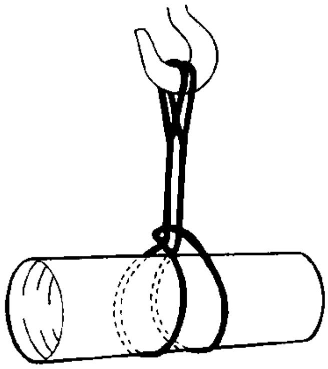


Figure 19.14: Double and Choke Hitch

Table 19.2: Sling-Load Connection / Attachment Rating Chart

This table shall be used in conjunction with the slinging method rating requirements outlined in Section 19.4.5.

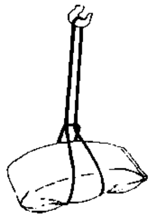
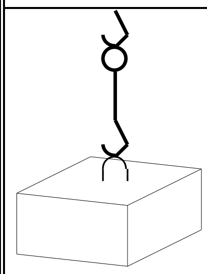
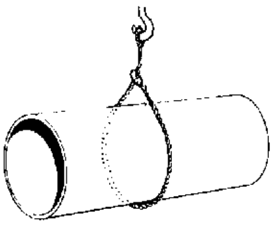
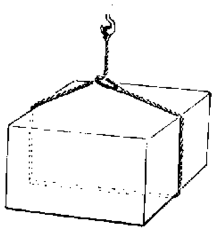
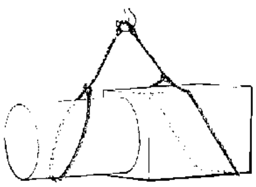
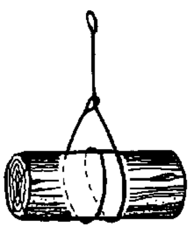
Diagram of Slinging Method	Connection/Attachment method	Rating
	*Endless Sling*	0.80
	*Straight Leg Sling*	1.00
	*Choke Hitch* Included angle $\leq 120^{o}$	0.75
	*Choke Hitch* Included angle $\geq 120^{o}$	0.50
	*Choke Hitch* 2 slings, included angle of any 2 legs $\leq 90^{o}$ - round 2 slings, included angle of any 2 legs $\leq 90^{o}$ - square	1.00 0.66
	*Double Wrap Choke Hitch* Included angle $\leq 120^{o}$ Included angle $\geq 120^{o}$ 2 slings, included angle of any 2 legs $\leq 90^{o}$ - round 2 slings, included angle of any 2 legs $\leq 90^{o}$ -	0.75 0.50 1.00 0.66

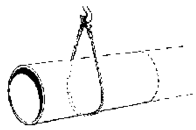
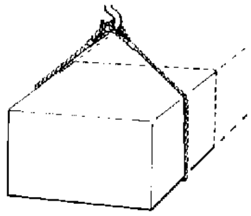
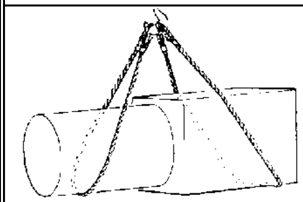
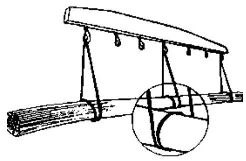
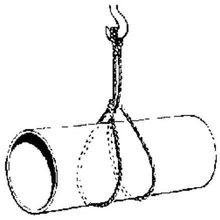
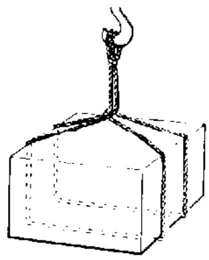
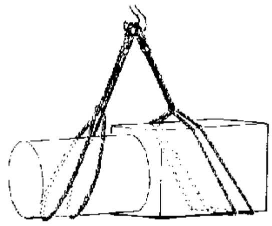
Diagram of Slinging Method	Connection/Attachment method	Rating
	square	
	*Basket Hitch* Included angle = 0^0	2.00
	Basket Hitch Included angle $\leq 90^o$	1.50
	*Basket Hitch* Included angle $\geq 90^o$	1.00
	*Basket Hitch* 2 slings, included angle of any 2 legs $\leq 90^o$ - round 2 slings, included angle of any 2 legs $\leq 90^o$ - square	2.00 1.33
	*Double Wrap Basket Hitch* Included angle = 0^o Included angle $\leq 90^o$ Included angle $\geq 90^o$ 2 slings, included angle of any 2 legs $\leq 90^o$ - round 2 slings, included angle of any 2 legs $\leq 90^o$ – square	2.00 1.50 1.00 2.00 1.33
	*Double and Choke Hitch* Included angle $\leq 120^o$	1.50
	*Double and Choke Hitch* Included angle $\geq 120^o$	1.00

Diagram of Slinging Method	Connection/Attachment method	Rating
	*Double and Choke Hitch* 2 slings, included angle of any 2 legs ≤ 90^o - round 2 slings, included angle of any 2 legs ≤ 90^o - square	 2.00 1.33

4.7 SOME ESSENTIAL PRECAUTIONS

4.7.1 Before Lifting the Load

- The weight of the load shall be ascertained before lifting and the lifting material shall be suitable for the load.
- The sling shall be strong enough for the load, both in terms of its safe working load and its actual condition. The sling shall be carefully inspected for obvious defects before use.
- The load shall be secure, stable and balanced when lifted so an assessment of the position of its centre of gravity is necessary to ensure that the lifting point is approximately over it.
- Failure to ascertain the centre of gravity is likely to cause the load to swing wildly on being lifted, or even to fall out of the sling.
- Any loose parts of the load shall be adequately secured either by the lifting method or by other means.

4.7.2 When Fitting the Sling to the Load

- The sling must be firmly secured to the load, e.g. by means of hooks on to purpose designed lifting points, eye bolts, etc. or by a suitable method of slinging. The sling must not be twisted, knotted or kinked in any way, nor shall the lifting points be overloaded by the slinging method.
- The rated included angle (90^o or 120^o) must not be exceeded and the angle at any choke shall not exceed 120^o or at any basket shall not exceed 90^o.

4.7.3 On raising or lowering the Load

- A recognised code of signals shall be used between the slinger and the crane driver (see section 19.3.7). Ensure that the load is free to be lifted, e.g. all holding down bolts and/or dowels have been released.

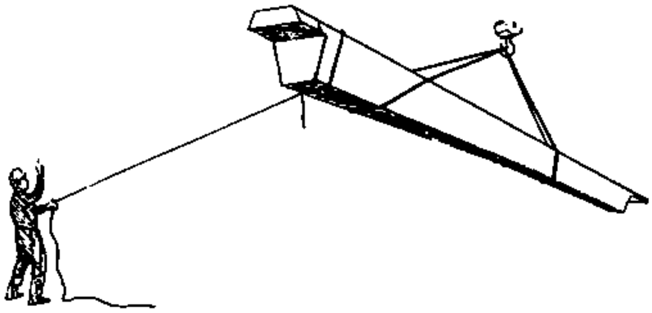


Figure 19.15: Taglines

- A suitable setting down area shall be selected before lifting. Make sure that the load is placed on battens, etc. so that the slings can be easily withdrawn.
- Having set the load down correctly, the empty sling legs shall be manually withdrawn by the slinger and hooked back on to the crane hook or upper terminal fitting to prevent accidental 'hook-up' of surrounding objects or the striking of an individual.

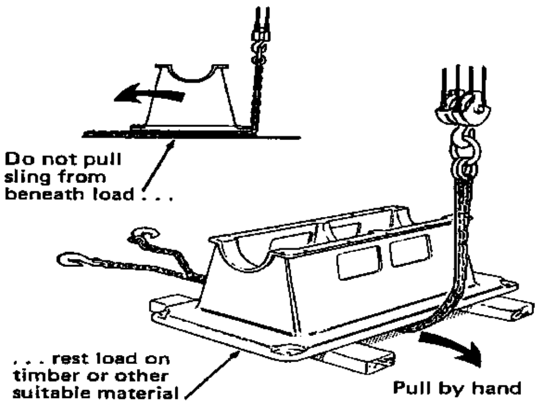


Figure 19.16: Place, Load on Battens

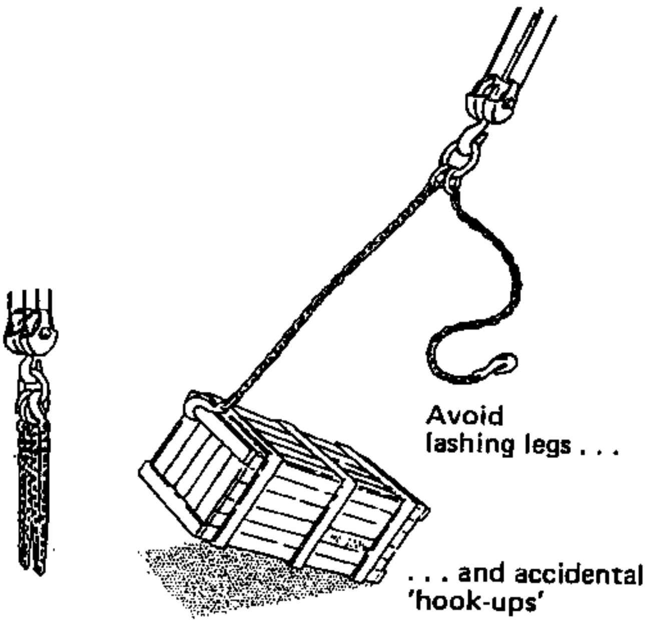


Figure 19.17: Tying of Sling Legs

4.7.4 Packing

Care must be taken, by the use of wood or other similar material, when slinging a load, to ensure that the sling is not bent over a small curvature or sharp edge, since this may damage the slinging. It is important also not to damage the loads. The objects of packing are:

- to provide an adequate radius around which a sling may pass without unacceptable loss of load carrying capacity
- to assist the sling in gripping the load
- to prevent damage to the load itself.

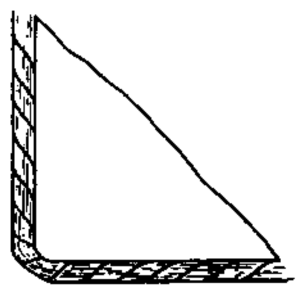


Figure 19.18: Wire Rope Kinked

Various materials are suitable for packing. Whatever is used must be capable of taking the crushing forces which will be imposed upon it, and it should be positioned to make best use of its strength (as is shown in Figure 19.19).

Figure 19.19: Good Packing

Example of bad packing is shown below in Figure 19.20. It shows timber packing at the corners which would almost certainly split under load and the load fall out.

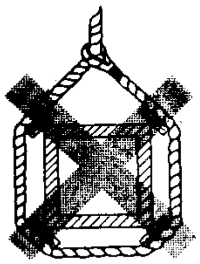


Figure 19.20: Bad Packing Practice

4.8 INSPECTION

Inspection requirements for rigging equipment are listed in Table 19.3 below.

Table 19.3: Inspection of Rigging Equipment

Items	**When Testing is Required**	**Thorough Examination**
Rings Hooks Shackles Swivels Similar items (e.g. eye bolts, turn buckles.)	Before taking into use and after repair	After proof testing and at least every six months
Wire ropes Wire rope slings	Before taking into use, a sample of the rope tackle should be tested to destruction and the breaking load recorded	After proof testing and at least every six months
Fibre ropes Fibre rope slings All textile based slings Round slings, etc.	Before taking into use, a sample of the material and/or sling should be tested to destruction and the breaking load recorded	At least every six months
All lifting machines and similar items (e.g. runways, jacks, beams, etc.)	Before taking into use and after repair	After proof testing and at least every twelve months

4.9 PERSONNEL LIFTS / HOISTING DEVICES AND AERIAL LIFTS

The devices covered by this section include non-lift suspended snorkel, scissors lifts, cherry pickers etc.

Personnel working in, or working from these lifts must wear a safety harness with a lanyard and secure their safety lanyard to the lift basket at all times (see Section …: *Working at Height*).

- Never exceed the SWL of the machine to prevent the machine overturning or overstressing the machine's components.
- Never position the machine over persons, or allow employees to go under the working platform, unless it is essential to the operation, and on these occasions take extra safety precautions.
- The platform shall not be used as a prop, tie or crane.
- Never move the platform closer than 4m to overhead electric lines unless permitted writing by the Electrical Supervisor.

4.10 WIRE ROPE GRIPS

- Wire rope grips shall be correctly applied in order that the stresses within the terminal are evenly distributed.
- Always fit the grips the same way round, with the bridge on the loaded or long part of the rope and the U-bolt on the short part.
- On any wire rope a minimum of three grips must be used and spaced at a centre to centre grip distance of six rope diameters. The numbers of wire rope grips required are:
  - up to and including 19mm (3/4 in.) rope: three grips
  - over 19mm and up to and including 32mm rope: four grips
  - over 32mm and up to and including 38mm rope: five grips
  - over 38mm and up to and including 44mm rope: six grips
  - over 44mm and up to and including 56mm rope: seven grips

4.11 ROPES / SLINGS

Combination ropes, i.e. wire ropes with a fibre covering, are not to be used as lifting gear.

4.11.1 Wire Ropes / Slings

- Flexible wire ropes or slings shall not be used if any broken wires are visible.
- Wire slings shall not be shortened by knotting.

Note: Docks' splice - sometimes known as a five-tuck splice, is a splice in a wire rope which has at least three tucks with a whole strand of the rope and two tucks with one half of the wires cut out of each strand. The strands in all cases are tucked against the lay of the rope. In all other cases, e.g. a compressed (swagged) ferrule, proof load testing is necessary to prove the effectiveness of the termination.

4.11.2 Fibre Ropes / Slings

- When joining fibre ropes, always use a double sheet bend. Never use a reef knot to join ropes.
- Fibre ropes must be hung up in a free circulation of cool air when not in use. Their exposure to oils, acid, or other chemicals shall be avoided.
- Fibre rope slings shall not be used for any duty if the rope is badly chafed externally, or worn internally, or where the fibres have noticeably deteriorated to a marked degree. Ropes in this unsafe condition are to be destroyed.

4.12 SHACKLES.

- Ordinary bolts shall not be used as shackle pins.
- Hooks that anchor ropes or pulleys on suspended scaffolds/loads shall be moused to prevent accidental unhooking.

- Shackles used in scaffolding / loads shall have their SWL clearly marked and when in use the pin shall be securely screwed in and moused to the Dee-rings.
- When using a shackle to form a running noose always fit the back of the Dee-rings to the standing or running part of the rope.

4.13 EYE BOLTS

Eye bolts shall be marked with the SWL, and, unless also marked to the contrary, or fitted with an integral link, the load shall not be applied other than longitudinally. If marked otherwise or fitted with an integral link the load is not to be applied in excess of 45^{o} from the longitudinal.

An eye bolt used for lifting shall have a screwed shank of at least $1^{1}/_{3}$ times the diameter. Both the male and female threaded portions shall be in good condition and the eye bolt be inserted completely before use.

The following table is for eye bolts according to BS 4278: 1984 and gives the maximum recommended working loads for angular loading of eye bolts with links and collar eye bolts with metric threads used in pairs.

Some eye bolts, may be marked with lower safe working loads than those shown in some standards. In these cases, the reduced safe working load for angular loading when used in pairs may be obtained by using the reduction factor given at the foot of the tables for each type of eye bolt.

Table 19.4 : Maximum Working Loads for Eye Bolts with Link to BS 4278: 1984

Thread size	**Axial SWL of single eye bolt**	**Maximum working load to be lifted by a pair of eye bolts when the included angle (a) between the sling legs is:**		
Metric		$0 < a < 30^{o}$	$30^{o} < a < 60^{o}$	$60^{o} < a < 90^{o}$
mm	tonne	tonne	tonne	tonne
20	1.0	2.0	1.6	1.25
24	1.6	3.2	2.5	2.0
30	2.5	5.0	4.0	3.2
36	4.0	8.0	6.3	5.0
48	6.3	12.6	10.0	8.0
Reduction Factor		1.0	0.8	0.63

5 LIFTING WITHOUT THE USE OF A CRANE

5.1 GENERAL

Riggers are often required to lift, or otherwise move, loads without the use of a crane. This usually involves the use of chain hoists, ratchet and lever pullers, winches, etc., perhaps in conjunction with gin poles, sheer legs, derricks, etc. In these situations a minimum safety factor of three shall be maintained at all times.

5.2 CHAIN HOISTS

As these hoists can easily be overstressed, the rules listed below shall be observed.

- Never exceed the SWL of the hoist.
- Ensure that the chain is not twisted.
- Never load the hoist when the chain is not in a true line from the hook to the main block.
- Keep the sheave pockets and the chain clean and lightly lubricated.
- If the chain jumps the sheave pockets, the chain may have stretched and shall be replaced.
- Do not suspend the load from the point of the hook or overstressing and distortion may occur.
- Mousing of the hooks is necessary to ensure they will not lose their load
- Frequently check the chain and hoist.

5.3 RATCHET AND LEVER TYPE PULLERS

There are several types of pullers available which use chains or wire rope. To avoid overstressing, handles must never be extended or operated by more than one person at a time. When replacing wire ropes, the correct type and size of steel-core rope shall be used.

5.4 GIN POLES AND DERRICKS

Gin poles consist primarily of a vertical pole, suitably stayed or guyed, and capable of being leaned out of vertical to a limited degree.

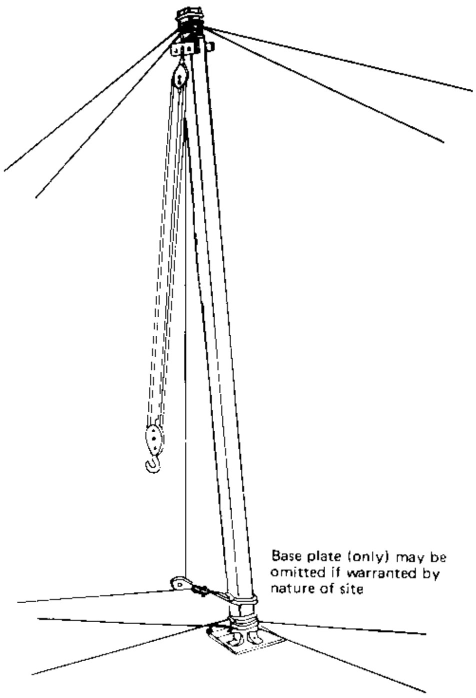


Figure 19.21: Derrick Pole

The following conditions listed below shall be complied with.

- A maximum of 1:10 slope from the vertical shall not be exceeded.
- Gin poles must be constructed of steel, with attachments at the head for suspending the load. In addition, gin poles shall be fitted with proper base plates.
- A gin pole of sufficient strength shall be used for the lifting task to prevent buckling or collapse.
- For loads greater than 10 tonnes, the guys and their end connections shall be designed by an appropriately qualified person.
- If more than one guy is used, then care must be taken to equalise the loads.
- Guys for gin poles and derricks shall be attached to proper anchorages, i.e. 'dead men' or substantial steel structures. They shall never be attached to pipelines, vessels or equipment supports.

5.5 CANTILEVERS

Cantilever beams, bolted down or held by counterweights are often used for lifting.

- No more than one third of the length of the beam shall protrude past the point of support.
- Calculations, based on the principle of moments, must be carried out an appropriately qualified person to ensure that a safety factor of three is always maintained (for consistency) in the beam and fastenings.
- Beams shall be packed to offset any change in moments due to protuberances on the surface on which the beams are resting.

5.6 OVERHEAD ROPES AND FLYING FOXES

- Cableways with moving towers as well as flying foxes used on large construction sites shall be designed and certified as to SWL by an appropriately qualified person.
- To avoid overloading, the no-load sag shall not be less than 1/20 of the span. Under load the sag should be approximately double the no-load sag.
- The backstay angles need to be of the same slope (1 in 5) to avoid increasing the load. At steeper angles the tops of towers or poles need securing to the rope to avoid being kicked out.
- The flying fox shall have four wheels with sheave diameters not less than eight rope diameters, spaced out to avoid undue bending on the track rope.

5.7 JACKS AND JACKING

The raising or lowering of a load by jacking is an operation that needs to be carried out with military-type precision. Generally the requirements for safe and efficient jacking are listed below:

- The jacked load shall be held steady throughout the jacking operation.
- On long loads both ends shall not be lifted simultaneously. Stabilise one end then raise or lower the other.
- If wedges are used, to level packings or load, they shall be driven tight and secured in position to prevent accidental displacement.
- Jacks shall have their SWL marked on them. In use, a margin of 25% below the SWL should be maintained.
- Jacks shall have solid timber packers on both load-bearing surfaces in order to minimise the possibility of displacement by slipping.
- The lift in all cases shall be vertical. At any sign of jack tilt, the load shall be packed and the jack reset vertically.
- Never extend jack handles as over-stressing will result thereby reducing the safe working capacity of the jack.

- On all jacks any worn parts shall be discarded and replaced to ensure the SWL capacity is not impaired in any way.

6 FORK LIFTS

6.1 INTRODUCTION

The purpose of this section is to maintain a degree of safety in the use of all forklift machines operated on SUPREME ENERGY sites. Forklift machines are very dangerous when not operated in a safe manner. The safety requirements in this section and the manufacturer's safety requirements shall be followed without exception.

6.2 RESPONSIBILITY

The Supervisor is responsible for ensuring that all forklift machines are operated by certified operators and for ensuring forklift machines are well maintained.

Forklift machine operators are responsible for ensuring that all the safe operations and work practices are understood and followed. In addition they shall comply with all relevant standards, codes of practice, procedures, and be responsible for their own safety, the safety of others, and the safety of property.

6.3 OPERATOR CERTIFICATION

No forklift machine is to be operated by any person unless they hold current certification of operation. Any person being trained on a forklift machine shall be under the direct supervision of a certified operator.

6.4 SAFE FORKLIFT OPERATING PROCEDURES

- It is the operator's duty to check that the machine is in a safe and satisfactory working condition before operating the forklift and that any faults detected are reported to the person in charge.
- Operators shall not start or operate the forklift machine, any of its functions or attachments, from any place other than from the designated operator's position.
- Hands and feet shall be kept inside the operator's designated area or compartment. No part of the body shall be put outside the operator compartment of the forklift machine.
- No part of the body shall be put into the mast structure or between the mast and the forklift machine.
- No part of the body shall be put within the reach mechanism of the forklift machine or other attachments.
- It is essential that forklift machine limitations are understood and that the forklift machine is operated in a safe manner so as not to cause injury to personnel. Pedestrian safety shall be safeguarded at all times.

- Forklift machines shall not be driven up to anyone standing in front of an object.
- Operators shall ensure that personnel stand clear of the rear swing area before conducting turning manoeuvres.
- Operators shall exercise particular care at cross aisles, doorways, and other locations where pedestrians may step into the path of travel of the forklift machine.
- No one may stand or pass under the elevated portion of any forklift machine, whether empty or loaded.
- Passengers are not permitted to ride on forklift machines unless a safe place to ride has been provided by the manufacturer.
- Before leaving the operator's position:
  - bring the forklift to a complete stop
  - place directional controls in neutral
  - apply the parking brake
  - fully lower the load-engaging means.
- If the forklift machine must be left on an incline, block the wheels.
- A safe distance shall be maintained from the edge of ramps, platforms and other similar working surfaces.
- Care shall be taken not to contact overhead installations such as lights, wiring, pipes, sprinkler systems, etc.
- An overhead guard is intended to offer protection from falling objects but cannot protect against every possible impact. It shall not be considered a substitute for good judgement and care in load handling. An overhead guard shall be used on all forklift machines as protection against falling objects, unless both of the following conditions are met:
- Vertical movement of the lifting mechanism is restricted to 1800mm or less from the ground.
- The forklift machine will be operated only in an area where:
  - the bottom of the top tiered load is not higher than 1,800mm, and the top is no more than 3,000mm from the ground when tiered
  - only stable, and preferably interlocked, unitised, or containerised, loads are handled
  - there is protection against falling objects from adjacent, high stack areas.
- A load backrest extension shall be used when necessary to guard against a load, or part of it, from falling toward the operator.
- In areas classified as hazardous, only forklift machines approved for use in those areas are to be used.
- All accidents involving personnel, building structures and equipment are to be reported to the Supervisor or as directed.

- Forklift machines are not to be added to, or modified, without the manufacturer's prior written approval.
- Access to fire doors, exits, aisles, stairways or fire equipment shall not be blocked.
- Whenever a forklift machine without controls that are elevated with the lifting carriage or forks is used to elevate personnel:
  - use a securely attached work platform
  - make sure the lifting mechanism is operating smoothly and properly
  - place mast in a vertical position and never tilt forward or rearward when elevated
  - place forklift machine controls in neutral and set brake
  - lift and lower smoothly and with caution
  - watch for overhead obstructions
  - keep hands and feet clear of controls other than those in use
  - move the forklift machine only for minor adjustments in positioning when personnel are on the work platform, and never at more than creep speed
  - remain in the operator’s position on the forklift machine
  - restraining means such as rails, chains, etc should be in place, or persons on the work platform shall wear a body belt and lanyard or retractable safety device.
- Ascend or descend grades slowly, and with caution.
- When ascending or descending grades in excess of 5%, loaded rider trucks shall be driven with the load upgrade.
- Unloaded forklift machines should be operated on all grades with the load engaging means downgrade.
- On all grades the load and load-engaging means shall be tilted back, if applicable, and raised only as far as necessary to clear the road surface.
- On grades, ramps, or inclines, normally travel straight up and down, avoid turning if possible and use extreme caution.

6.5 CHECKS

A checklist is attached, (Form 19.1), as a guide for operators to use in determining that a forklift machine is safe for use. Operator’s judgement is required to ensure that the machine is in a safe condition to operate. If it has defects that make it unsafe the machine shall not be used until the problem is repaired.

7 MANUAL LIFTING

7.1 INTRODUCTION

When lifting and handling materials, it is important to know the correct method of lifting and carrying. If incorrect methods are used personnel may suffer from strains, sprains, hernias, hand and foot injuries, spinal injuries, and torn ligaments and muscles.

7.2 THE SAFEST AND MOST EFFECTIVE WAY TO LIFT

Throughout any lifting and lowering action, follow the recommended procedures as listed.

- Check that the load is within your lifting capacity and, if necessary ask for help.
- Watch out for sharp edges, and wear gloves to protect the hands when necessary.
- If lifting something with one end heavier than the other, have the heavier end closest to the body.
- Place feet firmly, well apart, flatly on the ground, and squat down. Maintain good balance and get a good grip.
- Keep the back as straight as possible - this does not necessarily mean vertical. Lift slowly (do not jerk) by pushing with the leg muscles. Keeping the chin tucked in helps keep the back straight.
- Raise or lower the load as close as possible to the body. Avoid holding the load away from the body.
- Do not twist the body when lifting.

A strain can be caused more easily when lifting a bulky or awkward load than a compact one.

7.3 SAFE CARRYING

- Carry the load close to the body.
- Keep the back straight.
- Ensure your vision is not obscured.
- Never allow the load to interfere with normal walking. If it does, it is too heavy.

7.4 STACKING AND STORAGE

- Store heavier and more frequently used items at between hip and shoulder height. Only small infrequently used items should be stored above shoulder height or below hip height.
- Stack materials so that they cannot slip or fall, by interlocking or some other method.

- Arrange stacks in clearly defined lines with working aisles or passageways between them. The height of a stack is restricted by the capability of the lower layers to withstand the weight on them.
- Chock all round objects such as drums, paper rolls and logs if they are stacked on their side.
- Check that every stack is stable.

7.5 TEAM LIFTING

- It is safer for heavy, bulky or unusually long loads to use more than one person to lift them. Pairs or teams should be matched for height.
- Where more than one person is working on the lifting of a load, it is important that one person should be chosen to 'call' the lift to co-ordinate the movement and timing. This is important to avoid the weight being thrown to one side and too much weight being put on one individual leading to injury.

7.6 HANDLING OF DRUMS

7.6.1 General

- Before moving a drum, stand close to the drum with feet comfortably apart and with a hand either side, then gently rock it to get the feel of it and its contents.
- Keeping back straight, knees bent and having one foot slightly forward controls the movement of the drum. Have both feet flat on the ground, tilt the drum back towards you to a point of its balance. Once on the point of balance, the drum may be moved by wheeling it along by turning it on its rim,

7.6.2 Lowering of a Drum

- Place both hands over the front end of the drum with the thumbs inside the rim, and the heels of the hands and the fingers over the side of the drum. The grip is important.
- Raise the rear leg and use this as a lever using the body weight in counter balance to pull the drum back towards you.
- From this position, with feet flat on the ground and far enough apart to give good balance, bend your knees and stick your bottom out, keep back straight lower drum to the ground.

7.7 PLANK HANDLING

- Long loads are less easy to control than compact ones and their weight should be limited accordingly.

- A safe and comfortable method to handle a plank is to up-end the plank, keeping feet flat on the ground, stick your bottom out, lift one end of the plank and move towards the centre of the plank.
- Move with the forward end of the plank above head height especially when approaching doorways and the end of buildings so as to miss any unsuspecting person that may be hit.

7.8 COILS AND REELS

These items can be lifted as with any other load. They are usually fairly easy to grip. Remember to keep feet flat on the ground, stick your bottom out keeping your back straight.

7.9 LIFTING-LIKE ACTIVITIES

- The same care should be taken with all lifting- like activities, shovelling, using a pick axe, using a wheelbarrow etc.
- Keep feet flat on the ground, at least hip width apart, stick your bottom out, knees bent within mid-range and back straight whenever carrying out these activities.

7.10 SHOVELLING

Keep one foot placed between the material to be moved and the loading point with that foot in line with the direction of material travel.

7.11 USE OF WHEELBARROWS

Remember to lift and lower the wheelbarrow using the key points of safe lifting.

7.12 HANDLING BUCKETS

Remember Points for Safe Lifting. Place one foot forward so that the bucket is in the 'centre of the foot position'. Lowering the bucket is the same procedure in reverse.

NOTE: Using a hose to fill the bucket may avoid the need to lift the bucket while it is filling.

7.13 HANDLING WEIGHTS FROM WORK BENCHES

Ideally, the bench should be at about waist height. Get close to the weight. Feet flat, one foot may be forward of the other. Knees may be slightly bent, back straight. Use the same principles when putting the weight back down.

Do not leave a gap between the body and the bench when lifting or putting down the weight.

7.14 LIFTING AIDS

Wherever possible, mechanical lifting and moving appliances should be used, but make sure this equipment is used only by those who are:

- trained in the use of the appliance
- authorized to use such equipment.

8 CHAIN HOIST

Chain hoist may be used for limited duty such as light lifting, pipe jointing / welding and use not more than 50 cm height.

Factor of safety	4
Inspection	• Before use and after repair
Thorough examination	• After proof testing and at least every six months
Precautions :	• Chains shall not be joined together by using nuts and bolts. • DO NOT overload the hoist. • DO NOT exert more than the hand chain pull to lift rated load by one operator. The hoist is designed to lift its rated capacity when a reasonable force is exerted. If effort appears to be excessive, recheck the load and use a larger capacity hoist if necessary. • DO NOT side load the hoist. Make sure to pull in the straight line between hooks. Side loading the hoist over a sharp corner may fracture the hoist housing, load block or hook. • Be sure there are NO twists in the chain. Make sure that the load chain is free to move and clear all obstructions. With multiple chained hoists the load hook can be turned one or more times causing the chain to twist. • DO NOT use the hoist from an unbalanced / unstable position. Operators should have firm footing or be secured before operating the hoist. • Before raising and/or pulling a load always make sure that the slings and other rigging have sufficient capacity to support the load, and are in good condition. • DO NOT STAND BENEATH A LOAD. • DO NOT operate a load in a way to endanger personnel. • DO NOT leave the hoist with a suspended load. • DO NOT wrap the load chain around the load. USE A SLING.

	• DO NOT TIP-LOAD the hook, as this will exert undue strain, resulting in hook failure. • The hoist is designed for manual operation by one person only. DO NOT use the hoist with another power besides the manual power from one person. • DO NOT USE HOIST TO LIFT, SUPPORT OR OTHERWISE TRANSPORT PEOPLE. • The hand chain has a safety latch. When the safety latch opens or deforms, stop immediately to find out the cause. • Hoists are designed to lift loads vertically and SHOULD NOT be used for horizontal or angle hoisting. • NEVER use the chain or hook as a ground welding. • Use only parts and chains supplied by an authorized distributor.

9 APPENDIX

- Mobile Crane Plan
- Operator's Checklist for Forklift Machines

9.1 APPENDIX 1 : MOBILE CRANE PLAN

The following points need to be considered and if required a sketch drawn of the nearby hazards and the path of the load.
• Ground conditions (stability) • Underground services • Overhead lines/services • Communications/crane control • High energy systems (steam lines ….) • Causing an obstruction (i.e. fire exits ……) • Access to site • Hazardous areas (complete a ‘Hazardous Area Permit’)
(Sketch Plan)

9.2 APPENDIX 2 : OPERATOR'S CHECKLIST FOR FORKLIFT MACHINES

All Forklift Machines

1. Hour meter
2. General Lubrication
3. Steering
4. Tyres
5. Brakes
6. Brake fluid
7. Hydraulic controls
8. Hydraulic rams
9. Hydraulic systems
10. Lifting chains, pulleys, and wire ropes
11. Forks and retaining pins
12. Overhead guard and load backrest

Battery Powered Forklift Machines

1. Battery plug connection
2. Battery charge and electrolyte
3. Battery load test

Engine Powered Forklift Machines

1. Fuel Level
2. Oil level and pressure
3. Water level and fan belt

LPG Powered Forklift Machines

1. LPG gas cylinder secure
2. Safety relief valve positioned correctly
3. Fuel in cylinder
4. Check regulator hose and fittings
5. Fuel Level
6. Oil level and pressure
7. Water level and fan belt

supremeenergy	SAFETY HEALTH AND ENVIRONMENT WORK RULES	PROCEDURE
CORPORATE	WORKING AT HEIGHT	SE-MSHE-WOR-PRO-0010 Revision: 0

APPROVAL

	POSITION	NAME	SIGNATURE	DATE
Prepared by	SHE Engineer	Erwin Patrisa Floris		
Reviewed By	Sr. SHE Manager	M. Arief Tarunaprawira		
Approved By	VP Relation & SHE	Priyandaru Effendi		**17/05/2013**

REVISION HISTORY

REV	DATE	BY	REVIEWED	APPROVED	DESCRIPTION
0					For Use

TABLE OF CONTENTS

1. INTRODUCTION

This procedure is to provide safety process regarding to working at height at SUPREME ENERGY sites to manage activity for personnel working at height safely. As imperative as it is, that this work is done, and it must be done safely. In order to maintain a high level of safety where personnel working at height, control measures used to manage risks must comply with regulatory requirements and a comprehensive process is necessary for managing their activity, including training and qualifying personnel to do the work.

Falls from heights are the single most common cause of injuries and death in any industry group who work at height. Failure to recognize a hazard causes most falls.

Hazards that may present a risk from a fall include:

- vertical reinforcing steel, the edge of a rubbish skip, a picket fence, or a stack of bricks below workers
- un-sheeted floor bearers and joists 2 meters below workers
- work on a brittle material (e.g. roof).
- clutter and disorder
- handrails/guardrails missing or not being used
- slippery surfaces
- moving or carrying material or equipment
- ladders not secured at top and bottom and/or incorrectly positioned
- working from suspended platforms or elevated work platforms
- proper height work equipment not being used.

This section establishes the minimum standards for personnel while working at heights outside the confines of a catwalk or work platform.

2. LADDERS

2.1 Definitions

Leaning Ladder
A ladder supported in use by a separate structure, eg. a wall.

Single Section Ladder
A leaning ladder constructed and used as a single unit.

Extending Ladder
A leaning ladder consisting of two or three sections constructed so that the height can be varied, in increments of one rung spacing, by sliding the sections relative to each other.

Swing Back Steps
A standing step ladder in which the top is in the form of a tread and the back is merely a supporting frame.

Folding Platform Steps
A standing step ladder in which the top is constructed in the form of a working platform.

Folding Trestles
An arrangement of two frames hinged together, each fitted with cross-bearers suitable for supporting a working platform.

Lightweight Stagings
A working platform constructed of stiles, cross-bearers and decking, to provide a flat working surface.

Stiles
The side members to which the rungs, treads or cross-bearers are fitted.

Spacing (of Rungs, Treads or Cross-Bearers)
The distance, measured along the longitudinal axis of the stiles between the same relative positions of the members.

2.2 Use of Step Ladders

Portable ladders used incorrectly or in a defect condition present a serious hazard and cause many injuries. There are three main types of ladders:

1). Industrial: For heavy duty where relatively high frequency and onerous conditions of use, carriage and storage occur. Suitable for Industrial purposes. Duty rating 130 kg.

2). Light trades: For medium duty where relatively low frequency and reasonably good conditions of use, storage and carriage occur. Suitable for light trade purposes. Duty rating 110 kg (reference : EN 131 European Standard for Industrial Ladder).

3). Domestic: For light duty where frequency of use is low and good storage and carriage conditions pertain. Suitable for domestic and household purposes. Duty rating 95 kg.

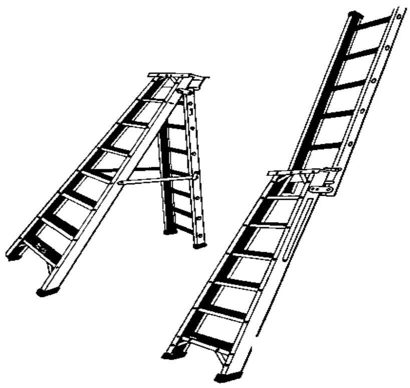


Figure 2.1: Ladder Erection Methods

Have someone hold a step ladder if you cannot erect it on an even footing with the spreaders taut.

Heavy duty step ladders may be used on inside work, as trestles to support scaffold planks, provided that the footing is firm and level and that the planks are not placed higher that the second to top step. The planks shall not span more than 2.4 meters.

2.3 General Use of Ladders

- Keep clear of power wires.

- Never use a ladder which is not long enough.
- Do not splice two ladders together even as a temporary measure to gain height.
- Always stand ladders on a firm non-slip and level base.
- Always wear shoes with heels when climbing a ladder. Do not climb a ladder with oil or mud on the soles of your boots.
- Ensure the ladder is not upside down.
- When ascending or descending always face the ladder and use both hands.
- Do not climb a ladder carrying anything in your hands.
- Do not throw down tools or material from a ladder.
- Do not allow two men to work on one ladder at the same time.
- Never over-reach sideways from a ladder, instead, get down and move the ladder.
- Do not stand a ladder on boxes, barrels, bricks, pieces of timber or any other insecure object to get additional height.
- Do not place a ladder across a doorway or in a passageway without taking some action to guard against people walking into it. Close and lock the door or protect the foot of the ladder with a stool or box.
- Do not erect ladders on footpaths or roadways without a red flag attached to the ladder stile, approximately 2m above ground level.
- Hold step ladders open by locking the metal spreader.
- Do not attempt to work from the top or second top step of a step ladder.

Care of shall be inspected on a regular basis, particularly before being used. Some of the items to be checked are:

- defective rungs.
- warping, cracking or splintering of stiles.
- faulty nails, screws, rivets, bolts and fittings.
- faulty feet.
- damaged locking / hinged spreaders.

2.4 Erection

The following points shall be observed:

- An erected ladder shall always rest against a solid support.
- On pole work or in windy places tie the top of the ladder to the support.
- See that the foot of the ladder is secure against slipping or have it held by another person. Failure to do this results in a high number of accidents. Use a bag of sand on a concrete floor or a nail batten to a wooden floor to prevent the ladder slipping.
- The slope of an erected ladder shall not be flatter than (3 to 1). The best working slope is 4 up to 1 out.

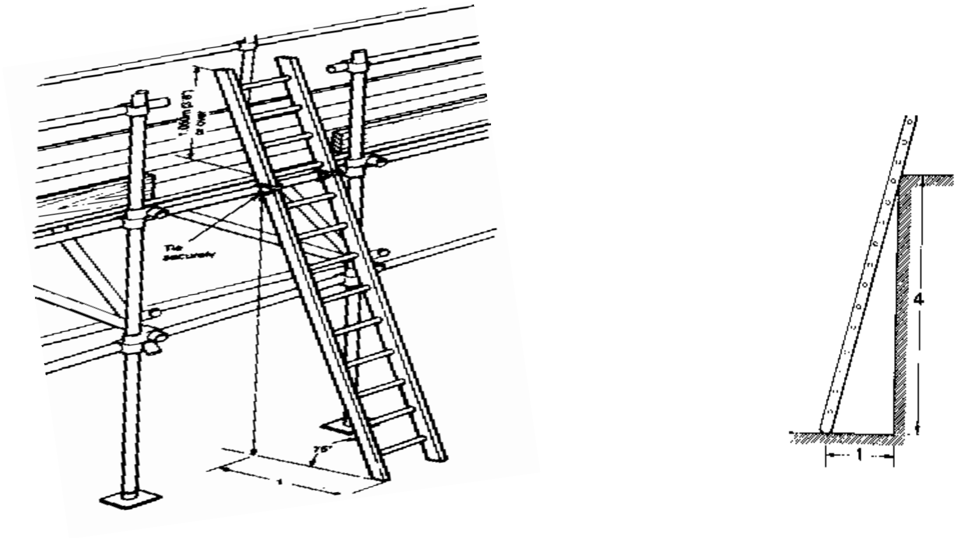


Figure 2.2: Ladder Working Slope

- A flatter slope than 4:1 is:
  - difficult to climb
  - liable to slip at the foot if not restrained
  - severe on ladder stiles
  - awkward to work from.

- A steeper slope than 4:1 is:
  - awkward to climb
  - easily pulled over backwards
  - difficult to work from and dangerous.

- Wrap the tops of the stiles with hessian if working against a smooth surface. It will protect the surface and prevent the ladder from slipping sideways.
- Where a ladder is used as access to a platform or roof it shall extend not less than 1m above the platform or roof level if no effective handhold is provided.
- Exercise extreme care when using a ladder against a springy support such as a tree branch or swaying woodwork. Secure the top of the ladder to avoid a throw-back.
- Spread step ladders properly to ensure stability.
- Always secure the ladder by lashing at the top and bottom or have someone hold the ladder.

2.5 Single and Extension Ladders

The lengths of single-section ladders and extending ladders when fully extended shall not exceed the lengths given in a) to c), as appropriate to the class:

a) Class 1: Industrial - 20 meters

b) Class 2: Light Trades - 10.7 meters
c) Class 3: Domestic - 9.1 meters

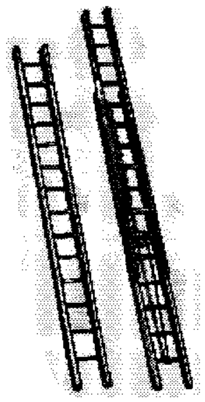


Figure 2.3: Single/Extension Ladder

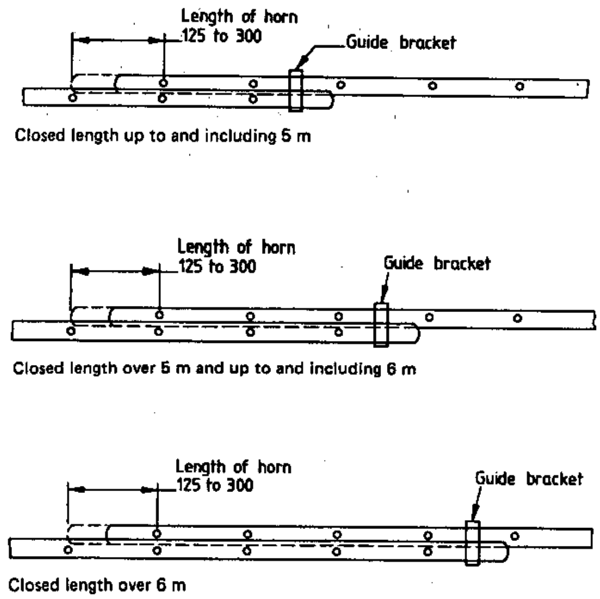


Figure 2.4: Overlap of Extending Ladders

3. SCAFFOLDING

3.1 Introduction

This section has been prepared to provide guidance on the planning for, erection of and subsequent use of scaffolding. It is intended to provide performance requirements for scaffolding standards.

Suitable and sufficient scaffolding shall be provided where the work cannot be carried out safely by other means. Standing scaffolds, suspended scaffolds or special scaffolds may be used.

3.2 Definitions

Factor of Safety
The ratio of the load that would cause failure of a member or structure to the load that is imposed upon it in service, and, unless otherwise prescribed or directed, shall be a minimum of 3 (three).

Free-Standing Scaffold
A standing scaffold which is not attached to any other structure and is stable against overturning on its own account or, if necessary, assisted by rakers (an inclined load bearing member) and anchors.

Guardrail
A rail or barrier secured to standards or upright members, and erected along the exposed sides and ends of working platforms to prevent persons from falling. A lower rail which is fixed to standards midway between the guardrail and platform is termed a midrail.

Hanging Scaffold
A working platform suspended by tubes, bolts, fixed rope slings or other methods and not intended for raising or lowering while in use.

Height
In relation to scaffolding or part of scaffolding, means the greatest vertical distance from which any article may fall from the highest working platform of the scaffolding to the ground or structure on which the scaffolding is supported or above which the scaffolding is suspended or fixed, as the case may be. In determining the distance which an article may fall, no account shall be taken of any obstruction which may delay or stop the fall unless there is no possibility of the fall continuing after the obstruction is reached.

Live Load
That portion of a load which does not include any part of the scaffolding or decking supporting the load, and comprises the weight of workers and/or materials.

Putlog (or Bearer or Transom)
A horizontal member placed in the transverse direction between ledgers, standards, or other supports and used to support a working platform.

Qualified Person

A person who, by possession of a recognized degree, certificate, or professional standing, or who by knowledge, training or experience has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the subject.

Safe Working Load (SWL)
The maximum load calculated in accordance with sound and accepted engineering practice, which can be supported safely under normal working conditions.

Scaffolder
A scaffolder is a person skilled, experienced and qualified in the erection, altering and dismantling of scaffolding.

Scaffolding

(a) Means any advanced scaffolding, basic scaffolding, or suspended scaffolding or any framework or structure, of a temporary nature, used or intended to be used:

- for the support or protection of persons carrying out construction work or work connected with construction work
- for the support of materials used in connection with any such work

(b) Includes any scaffolding constructed as such and not dismantled, whether or not it is being used as scaffolding.

(c) Includes any coupling, device, fastening, fitting or plank used in connection, with the construction, erection, or use of scaffolding.

Scaffolding Process
Is defined as the planning for, the design of, the erection of, the inspection of, the use of, and the dismantling of any scaffolding. The scaffolding process does not include the erection of structures constructed using scaffolding components, such as false work, temporary grandstands, and lighting towers.

Scaffold Register
A written record of inspections carried out for scaffolding.

Suspended Scaffold
A working platform suspended from overhead and intended to be raised or lowered while in use.

Sole Plate
A timber, concrete or metal bearer used to distribute the load from a standard or base plate to the ground.

Span
Means the distance measured along the member between the centre lines of adjacent supports of the member.

Tie

The attachment by which scaffolding is attached to a structure; it also means "tie and spreader" and includes the attachments used in conjunction with the spreader or putlog extension to secure a scaffold to a building or structure to prevent movement.

Toe Board
An up stand or vertical barrier at the edge of a platform intended to prevent materials, or workers' from slipping off the platform.

Working Platform
That part of a scaffolding on which workers and/or materials are supported for the purpose of carrying out construction work.

3.3 Materials

All scaffold materials shall be in sound condition and be examined before use.

3.4 Scaffold Planks

- All scaffold planks must meet the performance requirements specified by industry standards.
- Planks shall be frequently examined during use for splits, cracks, mechanical damage, excessive wear and decay. Planks which are defective shall be rendered unfit for further use.
- Normal standard plank size is 38 mm height x 200 mm width x between 1,800 to 3,900 mm length

3.5 Erection

- All scaffolding, shall be erected, altered and dismantled by competent scaffolders under proper supervision.
- Scaffolding shall not be used unless the supervisor of the work is satisfied that it is safe for use and complies with the relevant standards.
- Scaffolding shall not be altered or interfered with except on the instructions of the scaffolder. Scaffolders must ensure that members of the public are not endangered while they are erecting, altering or dismantling scaffolds. They shall also ensure that the lower working platforms are not used while the upper lifts are being worked on unless a fully decked platform, with screens if necessary, separates the part being erected or dismantled from the lower part in use.
- All scaffolders must have a basic knowledge of rigging.
- Scaffolding over 5m high or intended to extend over 5m, hanging scaffolds of any height and suspended scaffolding of any height may be erected, altered or dismantled only under the direct supervision of a person who holds an appropriate certificate of competency as a scaffolder.

3.6 Scaffolder Competence

A person who erects scaffolding, any part of which is 5 meters or more above the ground, must be able to demonstrate to SUPREME ENERGY that they are competent and experienced to the appropriate class of scaffolding, according to the following classes:

- Basic Scaffolding: The equipment range is to include free-standing modular system scaffolding, ropes, gin wheels, static lines and fall arrest systems.
- Advanced Scaffolding: The equipment is to include free-standing modular systems, tube and coupler scaffolding including tube and coupler covered ways and gantries, scaffolding associated with perimeter safety screens and shutters, cantilevered hoists with a load limit not exceeding 250 kg (materials only), ropes, gin wheels, safety nets for public protection, and catch nets, static lines and fall arrest systems, bracket scaffolds, cantilevered load platforms from a scaffold, cantilevered and spurred scaffolds, barrow ramps and sloping platforms, mast climbers, and hung scaffolding including scaffolding hung from tubes, wire ropes and chains.
- Suspended Scaffolds: The equipment range is to include hand-haul and mechanical boatswain's chairs, building maintenance units and hand-haul and mechanical swinging stages.

3.7 Permit-to-Work Scaffolding

- The supervisor shall ensure that scaffolding over 5 meters in height has been issued a General Work Permit and a work specific permit-to-work (Appendix 4.1 at end of this section) for scaffolding. See other procedure for obtaining a permit-to-work.
- A contractor shall not commence any scaffolding work above 5 meters without a permit-to-work.
- The Scaffolding Permit shall be displayed on the scaffold at all times. A copy of the permit is to be attached to the General Work Permit.

3.8 Inspection of Scaffolds

All suspended scaffolds and all other scaffolds are to be inspected before first use and at regular intervals. Details of these inspections are to be recorded on the Scaffolding Permit (Form 4.1) on-site register (attached at the back of this section). Inspections are to be carried out by a competent person for scaffold which lower than 5m height or by a certified inspector for scaffold which exceed 5m in height, or from which a person could fall 5m or more.

a) Initial Inspection
Before first use, the scaffold is to be finally inspected and any defects found are to be rectified before use.

b) Subsequent inspections

The scaffold is to be inspected at the following intervals:

- daily in the case of suspended scaffolds, or weekly in the case of all other scaffolds while the scaffolds are in use
- after each structural alteration, addition or change to the nature of the scaffold or its anchorages or ties
- monthly while the scaffold is set up but not in use
- after any storm or occurrence that could adversely affect the safety of the scaffolding.

Should any defect be found during these inspections, the defect shall be rectified prior to the scaffold being reused.

A scaffold tag (scaff-tag) may be used to identify the completeness and functionality of the scaffold (i.e. safe or not safe to use).

3.9 Protection and Maintenance

All scaffolding shall be protected against accidental damage from traffic or other causes and should, where necessary, be barricaded.

3.10 Access to Working Platforms

Access must be adequate and safe for the working conditions and type of work carried out. Access may be provided by permanently installed stairways, temporary stairways or portable inclined ladders. Personnel shall not be expected to climb vertical ladders, or to climb the scaffold structure to gain access to working platforms.

3.11 Scaffolding Near Electric Power Lines

No person shall erect any scaffold at any distance, in any direction, less than that shown in the table to any conductors of an overhead electric line.

Table 3.1: Minimum Distance In Any Direction For Construction Of Scaffolding And Other Structures Near Conductors

Line Voltage	Minimum Distance Under Normal Conditions (meters)
Not exceeding 66 kV (maximum span 125 meters)	4.0
Exceeding 66 kV (maximum span 25 meters)	5.0
Any voltage (span greater than 125 meters but less than 250 meters)	6.0
Any voltage (span greater than 250 meters but less than 500 meters)	8.0
Any voltage (span exceeding 500 meters)	As agreed with the owner of the line but not less than 8 meters

3.12 Scaffolding Over Gantries or Roofs

Gantries or roofs used to support scaffolding shall be certified as safe for the purpose by an appropriately qualified person. The layout of the scaffold, including details of sole plates and the propping system (if any) shall also be provided.

3.13 Lifting Appliances Mounted on Scaffolding

- Hoists, winches and other lifting appliances may be mounted on scaffolding only if the scaffold framework is adequate in strength or is specially strengthened and tied back to reduce vibration and whip.
- The strengthening shall be calculated with reference to an effective static load of not less than two times the safe working load of the lifting appliance.
- Where the lifting capacity exceeds 250kg (2,450N), the scaffold shall be strengthened to the design requirement of an appropriately qualified person.

3.14 Design Loads

- Dead Load: The dead load shall include the self-weight of the scaffold structure and components including working platforms, catch platforms, access platforms, stairways, ladders, screens, sheeting, platform brackets, suspension ropes, secondary ropes, traversing ropes, tie assemblies, scaffolding hoists, electrical cables and any other attachments, where appropriate.

- Environmental Loads: Where appropriate, the environmental loads shall include the following:
  - wind loads in accordance with recognized standards imposed on the scaffold, including any guardrails, toe boards, stacked materials, screens, sheeting, platform ropes, guy wires and other attachments;
  - rain loads, where it is considered likely that the scaffold an cladding will be subjected to rain;
  - earthquake loads in accordance with recognized standards.

- Live Loads: The live load shall include the following:
  - the weight of persons;
  - the weight of materials and debris;
  - the weight of tools and equipment;
  - impact forces.

- Duty Live Loads: The live load applied to a working platform shall be categorized by the following duty conditions:
  - Light-duty, a load up to 2.2kN per bay that includes a single concentrated load of 1kN;
  - Medium-duty, a load up to 4.4kN per bay that includes a single concentrated load of 1.5kN;
  - Heavy-duty, a load up to 6.6kN per bay that includes a single concentrated load of 2.0kN;
  - Special-duty, the largest intended load but not less than heavy-duty.

  For design purposes, the single concentrated load shall be assumed to be in the most adverse position within the bay.

3.15 Scaffolding Foundations

- Scaffolding foundations shall be adequate to carry the whole weight of the scaffold, including the imposed loads, and shall be maintained in a stable condition during the life of the scaffold. Steel base plates shall be used under all standards.

- When scaffolds are supported on the ground, suitable sole plates shall be used to spread the load. The sole plates shall preferably be long enough to support at least two standards.

- Timber sole plates shall be not less than 200 x 38 x 500 mm long. Unsuitable support material may not be used i.e. blocks, bricks etc.

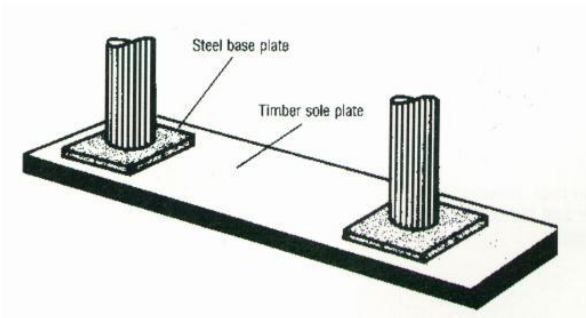


Figure 3.1: Support for Tubular Scaffold Standards

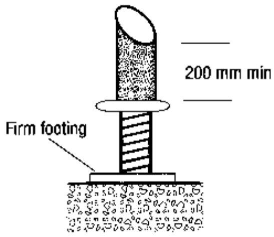


Figure 3.2: Adjustable Screw Extension

3.16 Working Platforms

Working platforms are classified as light duty, medium duty, heavy duty or special duty.

a) Light duty working platforms are platforms that are:
- supported in spans of not more than 2.4m
- not more than 1.5m in width
- designed to support concentrated live loads not exceeding a load of 2.2kN per bay that includes a single concentrated load of 1kN
- maximum height of a scaffold constructed in accordance with this standard is 33m.

b) Medium duty working platform are platforms that are:
- supported in spans of not more than 2.4m
- not more than 1.5m in width
- where the span exceeds 2.0m, one intermediate putlog shall be provided at mid span to support scaffold planks, a load of 4.4kN per bay that includes a single concentrated load of 1.5kN
- maximum height of a scaffold constructed in accordance with this standard is 33m.

c) Heavy duty working platforms are platforms that are:
- supported in spans of not more than 1.8m
- not more than 1.275m in width
- designed to support a load of 6.6kN per bay that includes a single concentrated load of 2.0kN
- maximum height of a scaffold constructed in accordance with this standard is 33m.

d) Special duty working platforms are platforms that:
- do not conform to the requirements of either a light duty or heavy duty platform with respect to loading and/or dimensions
- are of adequate strength and stability and have been approved by the supervisor before use
- may require an appropriately qualified person's design certificate for a special duty platform.

3.17 Decking

The decked width shall be not less than 600 mm, with sufficient additional width to leave 450 mm minimum clear walkway at all times.

Guardrails and Mid-Rail

- Guardrails, including mid-rail, shall be provided on the exposed sides and ends of all working platforms more than 3m in height. The height to the top of the guardrail shall be not less than 0.9m or more than 1.1m from the deck to be protected.
- Each rail, when secured to the standards or upright members, shall be capable of sustaining without failure or undue deflection a force at any point of 70kg (690N) vertical and 45kg (440N) horizontal, acting separately.

Toe Boards

A toe board or equivalent protection shall be fitted on the outside edge of every working platform more than 3m in height. The toe board shall be of sufficient height and strength to prevent the tools or materials from falling and shall be secured to the inside of the standards. A scaffold plank of 200mm minimum width may be used as a toe board.

Screens

Where the scaffold platform is above a thoroughfare, and due to the nature of the work falls of material are possible with injury to passers-by, special precautions shall be taken. Scaffolds that are screened shall be designed by an appropriately qualified person.

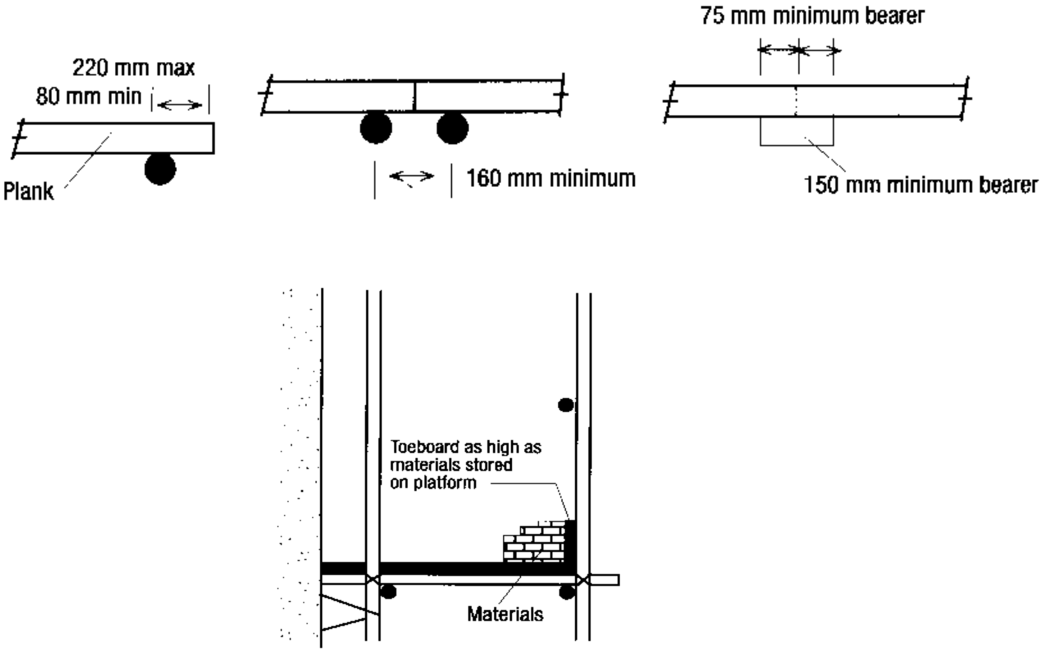


Figure 3.3: Decking

3.18 Headroom

- A scaffold platform used as a regular walkway or for the wheeling of loads shall have a clear headroom of at least 1.8m along the mid-half width.
- Where a succession of platforms are used to work up or down a face, the vertical spacing of lifts shall not exceed 2.1m except for the first lift, which if necessary may be up to 3m to allow for satisfactory working conditions at ground or floor level. When the height of the first lift exceeds 2.1m, extra bracing shall be provided on each pair of standards, commencing at approximately 1.8m from the ground.

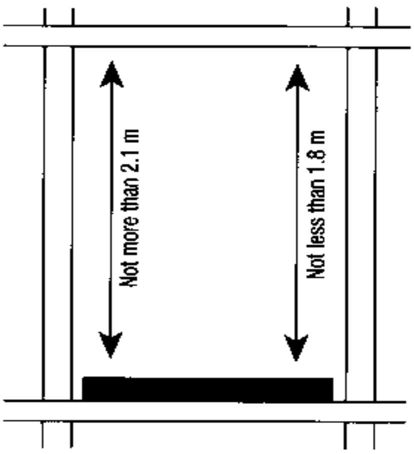


Figure 3.4: Headroom

3.19 Ties

All scaffold towers should be adequately tied to a building or structure. Where tying into a building or structure is impracticable, scaffold towers of 5m or higher will not be used without consulting a certified inspector.

3.20 Bracing

- Adequate bracing shall be provided. With such bracing, the distance between tie points shall not exceed 8.4m or four lifts.
- Temporary bracing and ties may be required to ensure stability of the scaffold during erection and dismantling. Bracing and ties can be used to prevent inward and outward movement of the scaffold and to assist the standards to act as load-carrying vertical members.

3.21 Requirements for Metal Tubes

The general requirements for metal tubes and fittings of steel or aluminum are:

- Metal tubes shall be purpose made with outside diameters accurately gauged to fit properly into the metal couplings and to allow complete interchangeability.
- Tubes in use on a scaffold shall be in good condition, free from bends and defects that might affect strength, reasonably free from corrosion and cut square at the ends. Tubes which are 3m and over in length should be reamed, if cut, to ensure safety when using internal joiners.
- When the loss of metal by corrosion or other causes reduces any cross section of a tube so that its corresponding weight is less than 90 percent of its original weight, the affected length of tube is to be discarded and rendered unfit for further use in scaffolding.
- Steel tubes shall be hot dipped galvanized or painted when used in scaffolds which are exposed for prolonged periods to marine or corrosive atmospheres.
- Fittings and couplings shall be specially made for the tubes in use and must be of a satisfactory quality as to strength and performance.
- Fittings shall be carefully maintained in good order and condition. They shall not be left lying around but stored in bags, boxes or bins, and kept well-oiled and protected from rusting.
- Special attention shall be given to the care and checking of screw threads and nuts; worn or distorted parts shall be discarded or replaced. Cracks or other flaws shall be watched for.

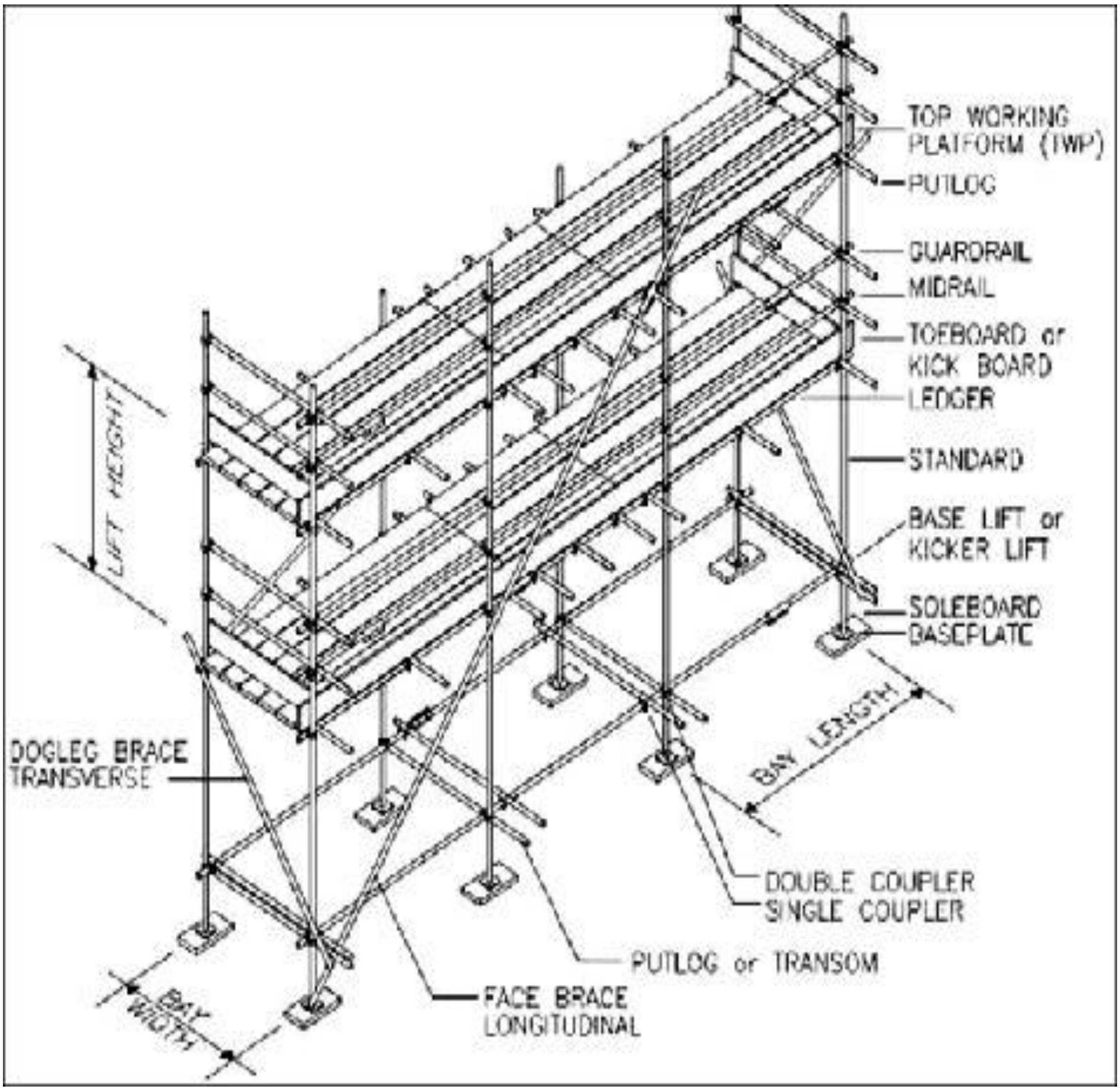


Figure 3.5: Metal Tube Scaffold

3.22 Framed Scaffold

- Prefabricated frames shall not be mixed up with frames of a different make or manufacture. The problem scaffolders will face is where frame scaffolding is used for heavy duty working platforms.
- Where heavy duty working platforms are to be used in conjunction with frame scaffolding, ledgers of scaffold tube will have to be provided in order that putlogs can be positioned mid span to reduce the span of scaffold planks.

Figure 3.6: Framed Scaffold

3.23 Mobile or Rolling Scaffolding

- Erection of mobile scaffolding shall be carried out by competent scaffolder and in all other aspects shall comply with this standard for scaffolding.
- Scaffolder shall ensure that the scaffolding is fully braced, both horizontally and vertically, in order that distortion in any direction does not occur.
- The scaffolding shall be used on firm, level surfaces. Always inspect the area in which the scaffold is used, especially for live overhead power lines (refer to Table 3.1).
- When in use, the scaffolding wheels shall be locked or chocked to prevent movement. On large mobile scaffolds it may not be necessary to do this as a considerable force is needed to shift them.
- Under no circumstances are persons permitted to ride the working platforms of a mobile scaffold while it is being moved.
- Access shall be provided to all of the working platforms and it is a wise method to position this access on the ends of the scaffold thereby reducing the overturning moment.
- As with all scaffolding, working platforms over 3m in height shall be equipped with correct guardrails.

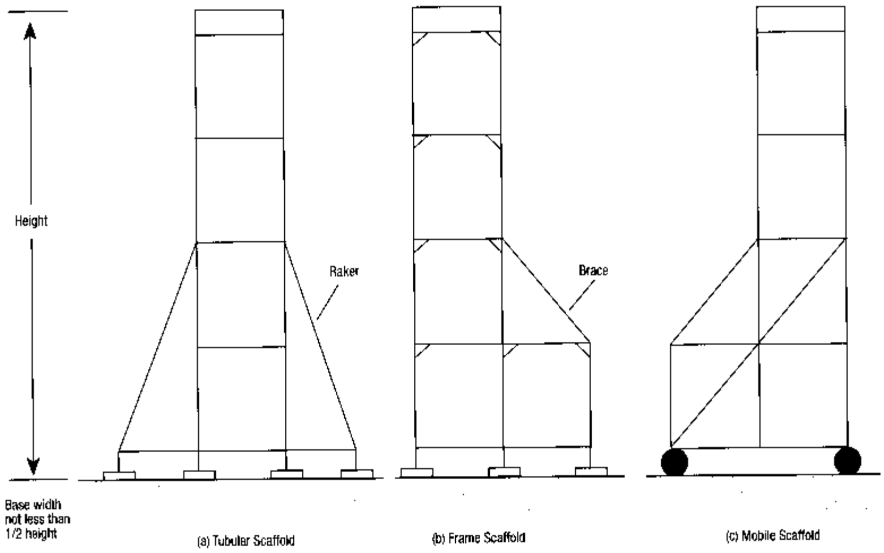


Figure 3.7: Free Standing Scaffolds

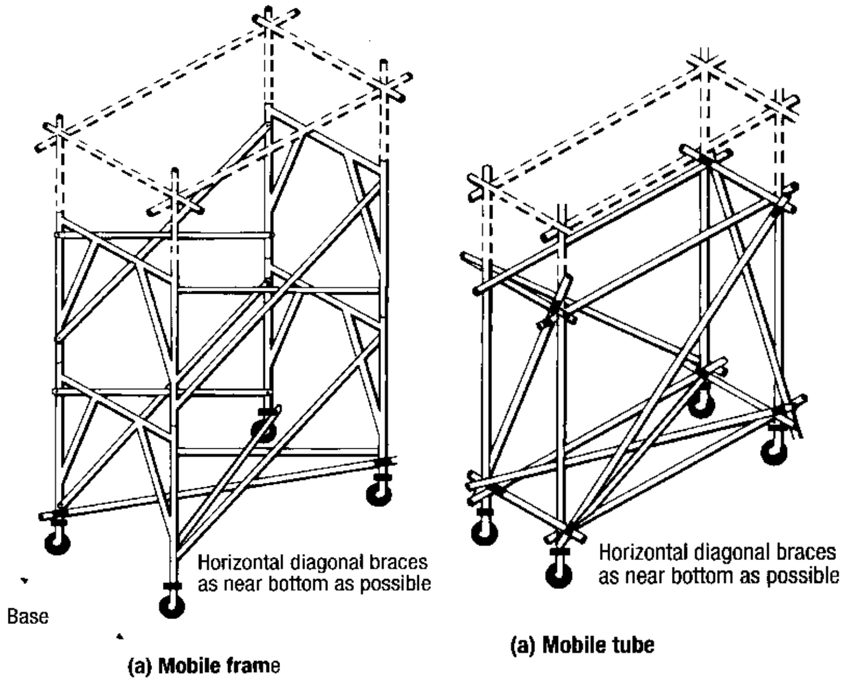


Figure 3.8: Free Standing Mobile Scaffolds

3.24 Suspended and Swinging Scaffold

- The scaffold shall be inspected as well as the anchorage, the ropes, and all of the fastenings. Always ensure that the maximum permissible safe working load is not exceeded.
- In the case of single overhead support, it shall not be more than 115kg.
- With double overhead support, it shall not be more than 340kg gross. Care shall also be taken when using a mechanical stage that the safe working load is not exceeded.

3.25 Access To and Egress From Working Platforms

- All working platforms that form part of any scaffold shall have suitable and safe means of access and egress from each platform.
- The scaffolder shall ensure that whatever the access, be it ladders, external stairs or access from adjacent buildings, persons are not in any way endangered by using it.

4. FALL PREVENTION

4.1 Introduction

This standard Practice establishes the minimum standard for personnel while working at heights outside the confines of a working platform.

4.2 Definitions

Competent Worker
Any worker who is adequately qualified, suitably trained and with sufficient experience to safely perform work assigned with only a minimal degree of supervision.

Full Body Harness
A device made primarily of straps for containment of the torso and pelvic area designed to support the user during and after the arrest of an accidental fall and/or during a rescue operation and/or during work activities, depending on the group classification of the harness.

Fall Arrest Device
A device that provides a means of arresting the accidental fall of an individual.

Fall Arrest System (FAS)
A system that will stop a worker's fall before the worker hit the surface below.

Lanyard
A short flexible line, rope or strap used to secure a wearer of a safety belt or harness to a lifeline. A lanyard is affixed to the harness and its anchor point by hardware (typically snaps).

Lifeline
Is a heavy line between two anchorages which may run either horizontally or vertically. Lanyards are attached to the lifeline allowing workers freedom of movement.

Pendular Effect

In situations where workers fall and are not directly in line with their anchor point, there is a tendency for the worker to swing as the fall is arrested.

Qualified Person

A person who, by possession of a recognized degree, certificate, or professional standing, or who by knowledge, training, or experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work or the subject.

Rope Grab

An arrester which moves over the lifeline and requires no manual adjustment during position changes. If an individual should fall, the arrester automatically locks onto the line. (There are several variations of rope grabs available.)

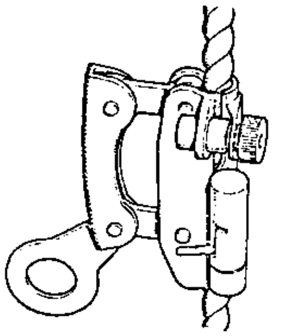


Figure 4.1(a): Rope Grab

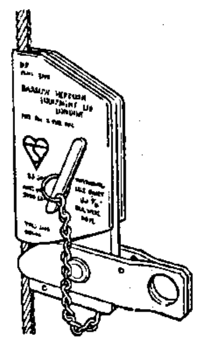


Figure 4.1(b): Rope Grab

Shock Absorber

A component of a personal fall arrest system that is normally attached to the body support device that dissipates kinetic energy and limits deceleration forces during fall arrest.

4.3 Responsibilities

The responsibility for establishing and administration of Fall Arrest Systems (FAS) lies with the supervisor. The authority for administration of the Fall Arrest program may be delegated to a competent worker. Responsibilities include, but not limited to ensuring that:

- FAS is adequate for its intended purpose
- personnel are trained and competent to use the FAS
- equipment is inspected and maintained in accordance with manufacturers specifications and the Standard Practice for Fall Arrest
- a rescue plan is prepared and reviewed in the event a worker falls and becomes suspended
- all elevated tools are analyzed to identify as well as provide adequate fall protection systems
- compliance to recognized standards relating to fall arrest.

Responsibility for the proper care and use of personal Fall Arrest System lies with the user.

4.4 Standards

Generally speaking, personnel are required to wear FAS when the possibility exists for a worker to fall a vertical distance greater than 3m.

Management shall recognize that a Fall Arrest System (FAS) is the last resort and shall only be used when the work cannot be conducted within the confines of a guarded catwalk or work platform. This form of passive protection is preferred over wearing harnesses etc.

Fall Arrest Systems have the two key objectives:

1). To arrest the fall without failing under load.
2). To be capable of distributing the fall energy to the user in a manner which will minimize injury?

Historically, the safety belt has been the first choice as a personal fall arrest device. The reason being, the simple design allows workers to put the belt on and take it off quickly. This results in a higher level of (workers) compliance to fall arrest protection.

Unfortunately, safety belts are unable to distribute fall energy throughout the body. When a fall is arrested by a belt, the body jackknifes at the waist. As a result, the individual has a high probability of sustaining a severe injury to internal organs, or even compromise breathing. Potential for fracture of the spinal column exists if the lanyard is in the front or on the side.

The second area of risk relates to the post fall suspension when there may be compression of internal organs or loss of consciousness. It is for these reasons that the full body harness has been designated as a minimum standard for FAS. Also there is a greater chance of slipping out of a belt harness if the wearer falls head first.

4.4.1 Horizontal Lifelines

- Horizontal Lifelines shall be made of at least 10mm wire rope cable properly supported to withstand at least 24kN impact. Alternate materials for specific cases (e.g. use of synthetic fiber rope) must be pre-authorized for use.
- Horizontal lifelines shall be positioned to provide points of attachment at the waist or higher to the operator / worker utilizing them.
- Lifelines shall not be used for any purpose other than fall protection.
- Horizontal lifelines shall be installed by competent personnel and inspected prior to use by personnel who are familiar with good rigging practices.

Figure 4.2: Horizontal Lifelines

4.4.2 Vertical Lifelines

Vertical Lifelines are used for personal fall protection when vertical mobility is required and may be comprised of static lifelines made of synthetic fiber rope or cable which has been equipped with approved sliding rope grabs or they may consist of self-retracting reel type lanyard / lifelines which are attached directly to a safety harness.

These types of lifelines can be used to provide fall protection for operations such as scaffold erection and structural steel erection where tie off points are limited and vertical mobility is required.

Sliding rope grabs approved for the size of rope used are the only method for securing a safety lanyard to a vertical lifeline and must be positioned at least above the users shoulder.

Figure 4.3: Vertical Lifelines

Figure 4.4: Self-Retracting Lines

4.4.3 Lifeline Placement / Installation

All horizontal lifelines placed in skeletal steel structures (e.g. pipe racks, etc.) shall be 10mm cable as a minimum and shall be secured on each end by three cable clamps.

Intermediate supports shall be adequate to minimize sag and vertical deflection to a maximum of seven degrees under loading. These lines shall be installed and maintained by the rigging crew.

Lifelines shall be arranged to provide adequate mobility in all areas of the structure while maintaining maximum fall protection for personnel. All horizontal lifelines shall be arranged to provide tie off points at least waist high for personnel using them and are not to be used for any purpose other than fall protection.

Note: Softeners shall be used where lifelines contact sharp edges such as beam flanges.

4.5 Ladders

Permanent caged ladders may be ascended or descended without additional fall protection.
When ascending or descending ladders, personnel shall maintain a three-point-contact. Materials or tools shall not be carried in the hands whilst ascending or descending ladders.

4.6 Personnel Lifts / Hoisting Devices

Aerial Lifts (Man lift, Snorkel, Scissors, etc.)
Personnel working from these lifts shall secure their safety lanyard to the lift basket at all times.

Crane Hoisted Personnel Baskets
Personnel working from personnel baskets shall have their lanyards secured whilst aloft.

4.7 Skeletal Steel / Open Structures

Fall protection is required when personnel are required to gain access to, travel and work in skeletal steel / open structures such as pipe racks. This includes travelling on or working on any elevated surface which is not designed as a personnel work surface or walk way (e.g. pipe, cable tray, etc.).

Personnel working or travelling in elevated skeletal steel / open structures shall secure their lanyards to a life line or structure capable of supporting 24kN at all times. In lieu of lifelines, personnel may secure safety lanyards to substantial structural steel members, pipe and pipe supports. Personnel shall avoid securing lanyards to cable tray, conduit and small bore threaded pipe.

4.8 Permanent Structures / Stairs, Caged Ladders

- Personnel working or travelling in incomplete permanent structures where fall exposure exist such as floor openings and open side floors, shall be tied off when within 1.8m of any fall exposure.
- Priority shall be given to installation and securing of permanent floors and walking surfaces and all guard rails and other permanent fall prevention devices.
- When required, temporary guard rails and floor opening covers shall be installed to eliminate fall exposures. When floor opening covers are installed they must be firmly secured, capable of withstanding load capacity equal to that of the floor and be painted and/or marked to indicate, “Open hole, do not move”.
- Personnel working within the confines of a completed scaffold platform equipped with all toe boards, rails, etc. may not be required to be tied off but need approval from the scaffold inspector.

4.9 Safety Nets

Safety nets may be used as secondary fall protection whenever there is a likelihood of personnel, materials, or tools falling on persons or property below. The use and installation of nets will be under the direction of an appropriately qualified person.

4.10 Inspection

Fall Arrest Equipment shall be inspected on a daily basis by the user. Should the user find any damage or note any defects, the equipment shall be taken out of service and examined by a competent person. In addition, Fall Arrest Equipment will be formally inspected when the units have been in use for six months. A written record of such inspections shall be retained on file.

Fall Arrest Equipment shall be inspected during General Planned Inspections and PPE compliance checks.

The following Fall Arrest Equipment shall be thoroughly inspected:

a. **Full Body Harnesses.**

- Inspect all buckles, Dee-rings and other metal components for cracks that may signal the beginning of metal fatigue, sharp or rough edges that could cut the webbing, rust or other corrosion, distortion, or other signs of wear.
- Check the metal wear pad at the base of the Dee-ring and make sure the Dee-ring pivots freely. Tongue buckles shall not be bent out of shape, shall move freely back and forth and shall overlap the buckle frame. Check that friction or quick-release buckles are not bent or distorted and engage correctly.
- Grommets shall be tight, not distorted or broken. Check for corrosion, dents, sharp edges or cracks. Discard a unit that has missing grommets or extra holes punched or cut into it.
- Make sure rivets are holding tightly and have not pulled through the webbing. Rivets shall not be bent; bent rivets will fail under stress. Pitted rivets indicate chemical damage.
- Examine all webbing, from end to end (both sides). Flex the webbing over your fingers, bending it to expose any signs of damage. Check webbing, straps, and reinforcing points carefully for wear and tear from fastening and unfastening buckles, and attaching snap hooks.
- Look for cut, pulled or broken switches, or frayed or damaged strands in the woven web. Discoloration, fused, brittle or melted fibers may indicate signs of chemical, paint, solvent, burning or heat damage.

b. **Lanyards and Securing Lines**

- Snap hooks and locking snap hooks shall function smoothly and not be bent or wobbly. Check that the spring closes the keeper (latch) securely against the snap nose. Locking snap hooks shall hold the keeper in a closed position. Inspect snap hooks, locking snap hooks and eyes for cracks, sharp edges, corroded or pitted surfaces, or distortion.
- Look for bent, cracked or broken rivals on web lanyard. Thimbles on rope lanyard shall not be distorted or have sharp edges. They should be held securely by the rope splice.

c. **Ropes**

Check that the rope is free of knots and consistent in diameter. Discard a knotted rope lanyard. Examine the rope from end to end, rotating it as you go and look for worn, broken or cut fibers. Look for damage that might be caused by welding, chemical or paints, or by exposure to heat sources. Thimble splices shall have five tucks and the hackling shall be secured from unraveling.

d. **Web Lanyards**

Examine webbing thoroughly from end to end as described above for full body harnesses. Pay close attention to stitching and rivets, particularly at hardware attachment points. Look for swelling, discoloration, cracks or charring from chemicals or heat damage, or other signs of deterioration or wear.

WARNING: Discard and replace equipment if there is any evidence of excessive wear, damage or deterioration, or malfunction.

4.11 Personnel Training

During site safety orientation and safety meetings, employees shall be made aware of SUPREME ENERGY fall protection policy and their obligations to these regulations.

4.12 General Precautions

- Be satisfied that you have had proper training in the use of fall protection equipment. If in doubt ask your supervisor or safety representative for assistance.
- Wear the correct size of full body harness and adjust it to fit you property. Never cut or punch extra holes or otherwise modify the unit if it does not fit or for other reasons.
- Make a visual inspection of this equipment each time you use it.
- Equipment shall be removed from service and tagged for repair or destruction whenever signs of wear or damage are found.
- Dee-rings on harnesses are to be used only for attaching lanyards or devices connecting to an anchorage point. Never attach anything other than the fall protection system connector to a Dee-ring. Never attach a lanyard elsewhere on the full body harness.
- Lanyards shall be as short as possible. This will minimize the discomfort from gravity stopping forces in a fall arrest.
- Never tie a knot in a lanyard. Knots reduce the supporting ability of a rope lanyard by 50%.
- Always use the right length of lanyard; do not tie or join two lanyards together to obtain the length required.
- Never use a ladder hook to attach a lanyard to a Dee-ring.
- A ladder snap is not designed to tie back to the lanyard. A sling or anchor strap must be used.
- Locking type rope snaps are approved to be tied back to the lanyard, however, non-locking type snaps are not.
- Lanyards with locking type snaps should be used to reduce the possibility of accidental disengagement, or roll out from the Dee-ring.
- Personal protective equipment shall not be used as slings or hoists or for other load bearing purposes. Harnesses or lanyards subjected to such alternate uses must be removed from service.

4.13 Attaching Lanyards / Connecting linkage to Anchorage Points

- Use the shortest possible lanyard. Always connect a lanyard above waist level to minimize the potential fall distance. Short lanyards reduce the possibility of a fall and minimize discomfort from gravity stopping forces in fall arrest. Shock absorbers also reduce the force of a fall.

- Select every anchorage point with care. The lanyard length and anchorage point of fall arrest device location shall never permit a free fall of more than 1.8m.
- Always check lanyard snap hook connections visually to ensure proper engagement. Do not rely on hearing an audible snap. Do not hook a lanyard around an anchor point and fasten the snap hook directly onto the same lanyard unless it is equipped with a locking rope snap.

4.14 Existing Pipe, Structures and Cable as an Anchorage

4.14.1 Fall Restraint Cable

Cable lifelines shall be a minimum of 10mm wire rope. The type required will vary with application and is to be verified with the supervisor.
Cable sag between intermediate supports of 6m - 15m spacing shall be 38mm minimum.

Note: Construction Stretch of 0.25% to 0.5% of cable length can be expected and wire rope may require periodic adjustment when used as a horizontal lifeline.

Intermediate supports shall be of sufficient height to support the cable at chest height (1.42m).

When securing to an anchorage point, the user shall take into consideration the deflection of the pipe or cable, the amount of stretch in the lanyard, the elongation of the shock absorber, plus the length of the users legs.

4.14.2 Pipe

A 51mm diameter pipe of either carbon steel or stainless steel is a safe anchorage for fall restraint lanyards under the following conditions:

- pipe is in good condition (not corroded)
- span is no greater than 6-15m
- pipe spans are continuous for at least two supports on either side of the attachment.

Permanent deflection of up to 60cm can be expected in a 51mm diameter pipe should a fall actually occur.

Do not tie off to insulated pipe of any size.

Do not tie off to electrical conduit of any size.

4.14.3 Structural Steel

- Structural members found on a 6m - 15m span will be adequate anchorage.
- All commonly used wide-flange and channel shapes are adequate.
- 64mm x 64mm x 10mm angle is considered safe provided the span is less than 6m.
- Handrails are not to be used as anchorage points.

4.15 Instructions for Care and Maintenance

- Fall protection equipment shall be treated with respect when not in use. Always store equipment in a clean, dry environment free of corrosives or harmful fumes and out of direct sunlight.

- Surface dirt and grime shall be removed from the equipment after each use. Accumulated soiling can mask signs of damage, as well as shorten the service life of the equipment. All equipment shall be cleaned by washing periodically and prior to the three month verification inspection.

4.15.1 Cleaning

- Nylon webbing or rope shall be cleaned only by sponging with a mild solution of liquid and either cold or warm water. Equipment should be wiped with a clean cloth and hung to dry out thoroughly, away from direct sunlight or excessive heat.
- Do not use solvent-based cleaners and do not apply paints or solvent markers for unit identification.

Warning: Do not attempt to repair damaged equipment. Destroy or remove it from service immediately and place a tag on it that states “DO NOT USE”.

5. APPENDIX

Appendix 5.1 : SE-MSHE-WOR-PRO-0020-01 Scaffolding Permit Form

5.1 Appendix: SE-MSHE-WOR-PRO-0020-01 Scaffolding Permit Form

SCF #: - - - - - - -

supreme energy	**SCAFFOLDING PERMIT**			
General Work Permit Number:				
Project Name:		Location:		
Address:				
Main Contractor:		Contact:		
Reason for Scaffold:				
Scaffold Erector:				
Subcontractors to use Scaffold:				
Height:	Length:	No of Platforms:		
Duty:		Limitations:		
INSPECTION RECORD				
Date	**Time:**	**Name of Inspector: (print)**	**Signature**	**Comments**

supremeenergy	SAFETY HEALTH AND ENVIRONMENT WORK RULES	PROCEDURE
CORPORATE	MOTOR VEHICLE SAFETY AND HEAVY EQUIPMENT	SE-MSHE-WOR-PRO-0011 Revision: 0

APPROVAL

	POSITION	NAME	SIGNATURE	DATE
Prepared by	SHE Engineer	Erwin Patrisa Floris		
Reviewed By	Sr. SHE Manager	M. Arief Tarunaprawira		
Approved By	VP Relation & SHE	Priyandaru Effendi		17/05/2013

REVISION HISTORY

REV	DATE	BY	REVIEWED	APPROVED	DESCRIPTION
0					For Use

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1. INTRODUCTION

This procedure is developed to demonstrate the SUPREME ENERGY's commitment to safe driving as one aspect of protecting company personnel, business partner personnel, public, and property damage. The goal of the procedure is "to continuously reduce the frequency and severity of motor vehicle incidents in Company working areas". This procedure describes minimum safety requirements that must be followed to ensure the safety of driver and operator to operate light vehicle and/or heavy equipment. The company will separately develop a comprehensive motor vehicle safety program.

2. RESPONSIBILITIES

It is SUPREME ENERGY policy to provide a safe working environment and expect safe driving practices from its drivers. Management and Supervisors are responsible for maintaining a safe driving environment and must lead by example. Supervisors must ensure drivers are aware of and follow safe driving practices in their respective work area. All personnel entitle to drive vehicle share the responsibility for driving safely. The effectiveness of Safe Driving Program depends on all Personnel accepting safe driving as part of their job.

Manager's Responsibilities

- Department managers or their designate are responsible for authorizing employees in their department to drive a motor vehicle.
- Department managers or their designate will only authorize employees to drive a motor vehicles if they have a valid business need and have a valid driver license.
- As a condition for authorizing employees to drive, Department managers or their designate must ensure all personnel under their supervision who drive have driving skills. For example, drivers must have a valid driver license / operator license and meeting the minimum criteria for the type of equipment they operate.
- Department managers or their designates must ensure that motor vehicles operated by personnel under their supervision are properly maintained and that basic systems essential for safe driving (lights, horn, brakes, steering, turn signals, safety belts) are functional. If a motor vehicle does not meet requirements for safe operation, it must be removed from service until repaired.
- Department managers or their designates must ensure that personnel under their supervision comply with the requirements of this SOP.

Supervisor's Responsibilities

- Supervisors are responsible for their employees have authorized to drive.
- Supervisors shall ensure their authorized employees have the necessary operating skills to drive in a safe manner for the vehicle they are authorized to drive / operate.
- Supervisors must ensure that all newly-authorized drivers are familiar with the contents of this procedure.
- Supervisors must thoroughly investigate each MVI(Motor Vehicle Incidents) and take appropriate measures if anyone is involved in a motor vehicle crash.
- Supervisors are responsible to investigate all MVIs involving their employees and submit "Report of MVI to SHE group.

Foreman / Driver Supervisor Responsibilities

Foreman / Driver Supervisor is the direct leader that has subordinate who entitle to drive vehicle, and responsible to:

- manage and supervise their drivers who are entitle to drive vehicle and ensure this procedure introduced and implemented by drivers.
- review Personnel driving exposure to minimize fatigue.
- ensure all Personnel is trained.
- set a good example by driving to "model" Company Standards in appropriate vehicle and recognize individual driving excellence.
- prepare the written preliminary report and send to SHE Representative and SHE Committee for further action. Systematically participate to investigate the incident.
- ensure compliance with company policies during Personnel's working hours.

Driver Responsibilities

- To ensure vehicle is appropriate for travel and properly maintained by contractor through regular routine inspections of mechanical condition.
- To maintain their vehicle in a safe condition including required regular inspection.
- To maintain safe driving conditions.
- To drive in a safe and responsible manner.
- To comply with traffic laws.
- To use all safeguards and safety equipment provided.
- To be familiar with and to follow the Safe Driving Practices plus any "Site Specific" rules that apply (i.e., vehicle type or equipment, area hazards, driver experience).
- To recognize when the vehicle or conditions are unsafe for driving and take appropriate action.
- To consult with their Leader / Supervisor if any doubt existing regarding safe driving.
- To correct and/or to report (verbally and/or written) any unsafe driving act or condition (including hazard identification and/or near misses).
- To take required driving training.
- To inform their Leader / Supervisor if they are taking drugs that may impair ability to drive, including medication for flu / colds and cough.

3. MOTOR VEHICLE

Motor vehicle is all vehicles that operated for Company's needs, not included in this definition are personal vehicle and public transportation.

A motor vehicle is any mechanically or electrically powered device (excluding one moved by human power), upon which or by which any person or property may be transported or drawn upon a land highway. The load on the vehicle is to be considered part of the vehicle if an accident occurs involving it.

Motor vehicle includes:

- Light vehicle: sedan, minibus, pickup.
- Medium vehicle: bus, truck.
- Heavy Equipment: work-over rig, boom truck, dump truck, and logging truck. Not include:
  - Vehicles operated on fixed rails
  - Trailer dozer
  - Forklifts
  - Road building and maintenance machinery
  - Crane

4. MOTOR VEHICLE INCIDENT (MVI)

Company MVI is any event involving a motor vehicle (owned or rented by the company) that results in death, injury, or property damage, unless such vehicle is properly parked.

Contractor or Sub-Contractor MVI is any event involving vehicle (owned or rented) used by Contractor or Sub-Contractor while performing work on behalf of SUPREME ENERGY.

All MVI must be reported. There are 2 (two) classifications of MVI based on the recordability:

- Recordable MVI : an MVI that after being investigated, resulting in criteria that classified as recordable MVI. All MVI that classified in this classification should be recorded into Company’s MVI record.
- Non-Recordable MVI : an MVI that after being investigated, resulting out of criteria that classified as recordable MVI. This classification should not be recorded into Company’s MVI record.

The following should not be recorded as MVI:

- Minor damage where the repair cost not exceed the maximum own risk from the vehicle’s insurance.
- Vehicle strikes an object which results in no damage and there is no repair required.
- Injuries that occur when entering or exiting a stopped or parked vehicle.
- Any event involving loading or unloading from a stopped or parked vehicle.
- Damage to or total loss of a vehicle solely due to environmental conditions.
- Crashes when the vehicle is properly parked.
- Flying debris i.e. rock, tree, to or from a vehicle.

The followings are not factors in terms of recordability:

- Who was responsible
- Where the incident occurred
- Who was injured
- What property was damaged
- The extent of such injury or damage

For analysis, MVI divided into 2 (two):

- Preventable MVI is any MVI that occurs when the driver fails to exercise every reasonable precaution to prevent it which results in property damage, personal injury and/or death, regardless who is injured, what property was damaged, how extent the injury was, or where the incident occurred.
- Non-Preventable MVI, is any MVI involving a vehicle used by Company which results in property damage, personal injury and/or death, that happened outside the parameters of the driver's ability to prevent it even the driver has done anything possible to avoid MVI to happen.

SHE Committee will decide the classification of the MVI after investigation.

5. DEFENSIVE DRIVING

Safety on the road is just as important as safety when operating dangerous machinery. A car, van or lorry can be very dangerous when used wrongly and the company’s attitude to road safety reflects this.

Before driving, notice that **all drivers must ensure that they have a current valid driving license.**

Defensive driving means showing an awareness of what is going on around one. Drivers should observe not just where the road is going, but also what others on the road are doing or might do. It means, for example:

- noticing when there are children playing near the road and slowing down in case one of them runs into the road; or
- watching traffic coming the other way and anticipating whether someone might overtake and come over onto the wrong side of the road.

The first part of defensive driving is that a driver must **look all round for other traffic and road users.** Remember that road users means pedestrians and cyclists as well as other vehicles.

The second part of defensive driving is to **react correctly to any hazards.** This means being prepared to slow down or stop or pull over to avoid another road user.

Defensive driving is a skill which can be learnt both through practical experience and by attending suitable training courses.

Speed Limits are very important in defensive driving and it is designed to increase safety for all road users.

A driver will always observe speed limits and drive below the speed limit when necessary. This means slowing down:

- when the weather is bad, for example in rain or fog
- during the hours of darkness
- where there are a lot of pedestrians
- on narrow or twisty roads
- when there are other hazards such as road works.

It is essential that drivers never go faster than the speed limit, both for their own safety and that of other road users. However, speed limits are the maximum safe speed.

Speed limits are different for different vehicle types. This is because larger vehicles do more damage and take longer to stop than smaller ones. Drivers who normally drive a smaller vehicle should remember this if they have to drive a larger one.

Another part of defensive driving is to always **obey the rules of the road,** for example giving way to other traffic at junctions. In order to do this driver should **make sure they are familiar with what all road signs and markings mean.**

These tell the driver, for example, when they are approaching a possible hazard such as a junction or bend.

Things happen quickly on the road and warning signs can only cover a few of the worst hazards. A defensive driver will **be aware of potentially dangerous areas.**

This includes areas where there are children or cyclists, or where there are a lot of pedestrians, for example markets and bus stations.

A good driver will be able to:

- look, think, and plan ahead
- observe carefully the entire area moving backward
- keep the eye moving (front, sides, and behind)
- make sure other vehicle see you (get eye contact and use warning devises, horn and lights)
- read the road ahead and anticipate what is going to happen
- be prepared for others to make mistakes.

Before setting off on a journey, a defensive driver will take a number of steps to ensure the journey will be safe and comfortable:

- remember that, even in small quantities, alcohol and drugs can impair a driver’s judgment and slow down their reactions
- do not drive when feeling unwell
- ensure that eyesight is good; wear spectacles if necessary
- always use a seatbelt and ensure that passengers do the same (where fitted)
- do not drive a vehicle which may be unsafe

6. WIDE / LONG LOAD VEHICLE (HEAVY EQUIPMENT)

Vehicles with wide or long loads are particularly hazardous for other road users. This is because;

- they take up much more road space than other traffic
- they move more slowly than other traffic
- they are difficult for the driver to maneuver.

There are some special rules which oversize vehicles shall follow:

Firstly use escorts (pilots) when needed to warn others of the presence of an oversize vehicle.
This means having other vehicles, such as light vehicle, which can go in front of the load and warn other vehicles who may need to stop or pull over to make way. The escort vehicle should carry a warning sign showing clearly what is the hazard,for example “Wide / Long Load Vehicle”.

Secondly adjust speeds appropriately for the size of load.
Because larger vehicles take longer to stop and are harder to maneuver than normal size vehicles, it is even more important to travel well within speed limits and to slow down well in advance of hazards such as bends or junctions. The driver of the escort vehicle shall also remember this.

Thirdly journeys should be timed to avoid meeting other wide loads.
The route used by wide / long loads vehicle visiting the site is narrow and there are few, if any, places where two loads can safely pass each other. Drivers of wide loads should therefore coordinate their movements to avoid this situation; for example by making upward journeys on even dates and downward on odd dates.

Finally travel at night whenever possible.
By travelling at a time when there are few other road users, either in vehicles or on foot, the possible conflicts which lead to accidents can be minimized. However when driving in the dark driver should drive more slowly than in the daytime and hazards such as pedestrians or animals will be harder to see.

7. VEHICLE SAFETY

As vehicles are used, parts of them become worn. Tires and brake pads get thinner, joints in the steering mechanism wear and become loose. All these things affect vehicle performance and safety. A vehicle which has worn brake pads takes much longer to stop. A vehicle with worn tires takes longer to stop and is much more likely to skid when stopping or cornering.

For all these reasons, it is essential that all vehicles are checked regularly to make sure they are fit to be on the road.

Daily Inspections

- All drivers should inspect their vehicles daily. Any major or safety-related defects must be reported and corrected before the vehicle is used. Minor items not affecting safe operation of the vehicle can be corrected during regularly scheduled preventive maintenance.
- For some vehicles such as buses and passenger pool vehicles, a formal pre-trip inspection should be performed and documented by the operator. The following items should be inspected:
  - Brakes should apply evenly to all wheels
  - Headlights should function properly
  - All stop lights, turn lights, rear lights, warning lights, and side-marker lights should function properly
  - Tires should be inflated to recommended pressures, have adequate tread, and should be free of cuts, breaks or other defects

- Steering wheels should be free from excessive play. Front wheels should be properly aligned
- Windshield wipers should wipe clean
- Window glass should be free from cracks, discoloration, dirt, or stickers that might obscure vision
- Horns should be functional
- Review mirrors should be installed so that the driver has a clear view to the rear and sides of the vehicle
- Stalling or lugging problems should be corrected
- All instruments should work properly
- Exhaust systems should be checked for leaks
- Where practical to do so, the vehicle should also be equipped with a spare tire and essential tools for road repairs

Preventive Maintenance

In addition to a driver's daily inspection of a vehicle, periodic preventive maintenance is essential. A preventive maintenance program based on either mileage or operating hours of the equipment (as recommended by the manufacturer or Company procedures) should be implemented to determine when to perform routine vehicle maintenance.

A vehicle safety checklist is given at the end of this section **(Form 21.1: Vehicle Safety Checklist)**

While it takes a trained mechanic to carry out a proper vehicle inspection, any driver can do a few simple checks to make sure their vehicle is fit to use. If the steering feels "wobbly", if the brakes take a long time to work or seem to pull to one side, or there are other obvious problems, this should be reported immediately and the vehicle should not be used until it has been checked.

Before taking a vehicle out, the driver should carry out a few simple checks by walking around the vehicle and testing the equipment inside:

- tires do not look worn or flat
- lights (including indicators) are working properly
- equipment such as horn and windscreen wipers are working properly
- never drive a vehicle which appears to be unsafe
- report any faults to the vehicle maintenance supervisor.

8. PEDESTRIANS

All road users are pedestrians sometimes. Unfortunately, when a vehicle hits a pedestrian it is the pedestrian who comes off worse. Although good driving is encouraged, it is in pedestrians' own interests to take precautions to protect themselves.

When walking on the road, pedestrians should

- beware of traffic - use their eyes and ears
- face oncoming traffic if at all possible

- take extra care where they have limited vision, such as at bends
- take extra care at places like corners where drivers will be watching other traffic
- help to protect old and young people who are less aware of the danger of traffic.

9. ROAD SAFETY CHECKLIST

Everything in this part of the manual is important and could literally mean the difference between life and death. Employees should always remember the below tips:

- learn what is meant by defensive driving and practice it
- obey all rules of the road
- drive at or below the speed limit
- make sure you are fit to drive
- make sure your vehicle is safe and roadworthy
- remember that special rules apply to wide and long loads
- carry a first aid kit and have first aid training
- report all accidents
- when walking, beware of motor traffic
- apply safe driving practices on site as well as on the road.

10. DRIVER TRAINING

Driver training should be provided to all employees who drive Company owned or leased vehicles. The training should provide a mix of classroom and on-the road instruction and should be administered by a skilled instructor. Dependent upon the situation, the following types of training may be offered:

- Basic - Training for new employees or those reassigned to a position requiring use of company or rental cars
- Remedial - Training for drivers who have had accidents
- Refresher - Periodic updating of basic training typically provided every 2-3 years. Training that is more frequent may be warranted depending upon the type of driving or other circumstances (such as new or different equipment, changes in regulations or policies, increased accident frequency, etc.)
- Special - Training provided for the operators of special equipment

Points to Cover:

- Local traffic rules and regulations for the operation of vehicles
- Company driving policies and procedures
- Defensive driving
- Local culture and attitude to driving
- Product or cargo knowledge and emergency procedures (as appropriate).
- What to do in case of an accident

Driving is primarily a learned skill. It must be practiced and reinforced if we are to achieve and maintain a high level of competence.

Defensive Driving Training (theory and practical) should be conducted at least one each two years for individual entitled to drive company-leased vehicle to refresh driving ability and competency

Defensive Driving Briefing (recommended practice and sharing lesson learned) should be conducted at least monthly.

Form 1.1: Vehicle Safety Checklist

SUPREME ENERGY
Vehicle Safety Inspection Checklist

Date:	**Inspection:**	**Employee #:**
Vehicle:	**Type:**	**Odometer:**

NO	INSPECTION	OK	UNSAFE	REMARKS
Steering and Suspension				
1.	Free play & steering wheel: .... inches			
2.	Tires (Tread wear, Condition, Inflation)			
3.	Alignment			
Brakes and Hydraulic System				
1.	Pedal Travel			
2.	Fluid Level			
3.	Hand Brake			
Clutch and Transmission Linkage				
1.	Clutch Pedal Free Play			
2.	Clutch Linkage (free and smooth)			
Safety and Security				
1.	Seat Belt Installed and Anchored Securely			
2.	Seat Belt Condition			
3.	Seat Adjuster (moves free, lock securely)			
4.	Door Latches and Locks			
5.	Windshield and Other Window			
6.	Rearview Mirrors			
Electrical and Instruments				
1.	Headlights (High/Low Adjustment)			
2.	Tail Lights			
3.	Brake Lights			
4.	Turn Signals			
5.	Instrument Panel Lights			
6.	Windshield Wiper Operation			
7.	Windshield Wiper Condition			
8.	Horn			
9.	Warning Lights			
10.	Speedometer			
11.	Fuel Gauge			
12	Other instrument			
13.	General Wring Condition and Fuses			

NO	INSPECTION	OK	UNSAFE	REMARKS
Engine Compartment				
1.	Belt (Condition and Tension)			
2.	Hoses (General Condition)			
3.	Radiator (Condition and Security)			
4.	Battery (Secure, Condition)			
5.	Fuel Lines (Routine, Condition)			
Undercarriage				
1.	Exhaust System (Security and Condition)			
2.	Fuel Tank (Security and Condition)			
Leaks				
1.	a. Master Cylinder			
	b. Lines/Hoses			
	c. Wheel			
2.	Engine Oil			
3.	Engine Coolant/Radiator			
4.	Power Steering Fluid			
5.	Transmission Oil			
6.	Rear End/Differential Oil			
7.	Fuel			
Emergency Equipment				
1.	Jack and Lug Wrench			
2.	Spare Tire (Condition/inflation)			
3.	Warning Reflectors/Flares			
4.	First Aid Kit			
5.	Fire Extinguisher			

NO	GENERAL VEHICLE CONDITION	GOOD	BAD	REMARKS
1.	Exterior			
	a. Body Damage			
	b. Rust			
	c. Paint			
	d. Fittings			
2.	Interior			
	a. Upholstery			
	b. Housekeeping			
	Road Test			
Engine				
1.	Starting (cold)			
2.	Starting (hot)			
3.	Idling			
4.	Driving			

NO	GENERAL VEHICLE CONDITION	GOOD	BAD	REMARKS
Clutch				
1.	Engagement			
Transmission				
1.	Shifting			
2.	Noises			
Drivetrain				
1.	Smooth/Quit/Tight			
Steering and Suspension				
1.	Tracks True			
2.	Shimy/Wobble			
3.	Steering Effort			
Brakes				
1.	Stop Straight and True			
2.	Shodder/Squeal			
Checked by:		Reported to Site Sr. Leader:		
Comments by SHE Representative :				

……
……
……
……
……
……
……

Hazardous Energy Control Program

Date: _________________ Area / Location: _________________________________

Person Responsible For Hazardous Energy Control Program

Name: ____________________________ Job Title: ________________________

Machine / Equipment Type

List types of equipment where these same procedures would apply (i.e., equipment of the same type with similar energy sources)

____
____
____
____
____

Location of Equipment:

____
____
____
____
____
____

Energy Controls

Identify and describe the types of energy controls in use and their capability of being locked out.

Types of Energy Controls:

____
____
____
____

Energy Sources and Controls

Check and/or list energy type and magnitude for this equipment:

Electrical____________ Steam_____________ Hydraulic_____________
Air powered___________ Natural Gas_____________ Other____________

Can the machine be locked out at the main energy source? ___

Stored energy sources:

Identify Energy Sources Type and Magnitude) and Location:	Lockable? Yes or No	Type Lock/Block Device Needed

Shutdown / Lockout Procedures

List, in order, the steps necessary to shut down and de-energize the equipment. Be specific. List the control type and location. For stored energy, be specific about how the energy will be released or controlled

NOTE: Notify affected Personnel whenever these procedures will be completed.

Shutdown (What control applied & Location of the control):

____
____
____
____
____

Isolation (What control applied & Location of the control):

____
____
____
____
____
____
____

Lockout / Tagout (What control applied & Location of the control):

____
____
____

____
____

Control / Relieve Stored Energy (What control applied & Location of the control):

____
____
____
____
____

Verify Equipment Isolation (What controls shall be tested):

____
____
____
____
____

Start Up Procedure

List steps necessary to remove lockout / tagout devices and re-activate (energize) the equipment. Personnel must be clear of area during any testing or activation.

NOTE:
Lockout / tagout devices to be removed by or with the approval of the authorized Personnel who installed them or, if necessary, under the direction of the supervisor in charge of the job.

Lockout / Tagout Removal:

____
____
____

Start Up Procedure:

____
____
____

Procedures Involving More Than One Person

List the procedures that will be used if more than one person is involved in the LOTO work. One or more of the following categories may apply.

Group Lockout:

____
____
____
____

Lockbox:

____
____
____
____

Job Locks and/or Tags:

____
____
____
____

Shift or Personnel Changes:

____
____
____

Outside Personnel and Contractors:

____
____
____

Alternate Procedures

List those operations where the procedures do not apply (such as in tagout only, etc.). Alternate measures that provide effective protection must be developed for these operations.

____
____
____
____
____
____
____
____
____

Affected and Authorized Personnel

List each person affected by this procedure and those authorized to use this procedure.

Affected Personnel's Name	Occupation / Job Title	Location
Authorized Personnel's Name	**Occupation / Job Title**	**Location**
Other Personnel's Name	**Occupation / Job Title**	**Location**

supremeenergy	**SAFETY HEALTH AND ENVIRONMENT WORK RULES**	**PROCEDURE**
CORPORATE	**ENERGY ISOLATION - LOTO**	SE-MSHE-WOR-PRO-0012 Revision: 0

APPROVAL

	POSITION	NAME	SIGNATURE	DATE
Prepared by	SHE Engineer	Erwin Patrisa Floris		
Reviewed By	Sr. SHE Manager	M. Arief Tarunaprawira		
Approved By	VP Relations & SHE	Priyandaru Effendi		**07/10/2014**

REVISION HISTORY

REV	DATE	BY	REVIEWED	APPROVED	DESCRIPTION
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1. INTRODUCTION

Appropriate Lockout / Tagout (LOTO) procedure should be followed during maintenance and repair work on equipment connected to or containing mechanical, electrical or other energy sources. The purpose of LOTO procedure is to prevent the accidental release of energy sources which could result in injury to personnel or damage to equipment.

LOTO is generally accomplished by isolating the equipment to be worked on from external energy sources, neutralizing internal energy sources, placing padlocks and warning tags on isolation devices, and establishing a system to manage the process changes caused by isolating the equipment. LOTO does not usually apply to normal operating activities such as collecting samples, replacing pressures gauges, or making routine operational equipment checks and adjustments. Some systems are designed to normally operate with components locked or chained in position (e.g., pressure safety valves locked open or containment drain valves locked closed). These systems should be managed in a manner consistent with LOTO procedure.

When new equipment is installed, or when existing equipment is replaced, repaired, renovated or modified, it should be designed to accept appropriate lockout devices, blinds or other methods of isolating and neutralizing energy sources.

2. LOCKOUT / TAGOUT DEFINITIONS

Affected Personnel - A personnel who operates equipment or machines on which service or maintenance is being performed under LOTO procedure, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

Authorized Personnel - A personnel who is authorized and initiates the LOTO procedure on machines or equipment in order to perform servicing or maintenance work on the machine or equipment (i.e., the person locking out / tagging out the equipment also is the same person doing the work on it). Affected personnel becomes an authorized personnel when that personnel's duties include performing servicing or maintenance on the equipment being locked out / tagged out and that personnel has successfully completed appropriate training.

Energized - Connected to an energy source or containing remaining or stored energy.

Hazardous Energy / Substance Isolating Device - A mechanical device that physically prevents the transmission or release of energy. These devices include, but are not limited to, the following: manually operated electrical circuit breaker, disconnect switch, skillet blind, blind flange, line valve, and block valve. This does not include a push button or selector type switch.

Hazardous Energy/Substance Source - Any source of electrical, mechanical, hydraulic, air powered, chemical, thermal, pressurized piping, compressed air, or other stored energy; which, in the event of unexpected energization or startup of machinery / equipment or release of stored energy, could cause injury to personnel.

Inspector - A designated authorized personnel who is assigned to inspect the energy control (LOTO) procedures of other specific authorized personnel or specific equipment where LOTO procedure is applied.

Job-Lock - A device used to provide the continuity of energy isolation during multiple shift operation. It is placed on a lockbox. A key to the job-lock is controlled by each assigned primary authorized personnel for each shift.

Lockout - The placement of a lockout device on a hazardous energy / substance isolating device, in accordance with an established procedure to ensure that the hazardous energy / substance isolating device and equipment being controlled by it cannot be operated until the lockout device is removed.

Lockout Device - A device that utilizes a positive means such as a keyed lock or a combination lock to secure a hazardous energy / substance isolating device in a safe position and prevent the energization of a machine or equipment. Included are blank flanges and bolted slip blinds.

On The Job -This refers to the specific servicing and maintenance job where LOTO procedure is in effect. This is not necessarily when the individual reports to work which may be away from the site of the service/maintenance work.

Other Personnel - Personnel whose duties do not require them to be involved in the LOTO procedure in any way. Training requirements are minimal, essentially requiring only that the personnel be aware of the energy control program and know that they are prohibited from attempting to restart or re-energize machines or equipment that are locked out / tagged out.

Primary Authorized Personnel - The authorized personnel who exercises overall responsibility for following to the LOTO procedure.

Principal Authorized Personnel - Authorized personnel who oversee or lead a group of servicing / maintenance workers (e.g., electricians, mechanics, etc.)

Tagout - The placement of a tagout device on a hazardous energy / substance isolating device, in accordance with an established procedure, to indicate that the hazardous energy / substance isolating device and the equipment being controlled by it shall not be operated until the tagout device is removed.

Tagout Device - An obvious warning device such as a tag and a means of attachment, which can be securely fastened to a hazardous energy / substance isolating device, in accordance with an established procedure, to indicate that the hazardous energy / substance isolating device and equipment being controlled by it shall not be operated until the tagout device is removed.

3. LOCKOUT / TAGOUT EQUIPMENT

Any device that is needed to control hazardous energy should be operated in a manner that will isolate the affected equipment from its energy source (for example, opening the electrical disconnect switch, in an electrical control panel, closing the valve, installing blind, or setting brake).

The following equipment is normally used for LOTO:

3.1 Padlocks

- Locks used for LOTO should be keyed padlocks. Each padlock should be keyed differently. Supervisors should retain spare keys for each padlock assigned to their work area.
- Padlocks should be color-coded to identify the group which owns them. The following color code is recommended for padlocks:
  - Yellow - Operations
  - Red - Electricians
  - Blue - Maintenance (except Electricians)
  - Green - Instrument Technicians
  - White - Facilities Engineering
- Depending on the facility (size and number of personnel), padlocks may be individually assigned or placed on a lock board for common use. A log should be maintained with each lock board, which identifies who is using each padlock and where the padlock is being used.
- Padlocks used for LOTO should not be used for other purposes.

3.2 Tags

- Tags should be used to identify locations where equipment has been altered for LOTO, including valves, flanges, skillets, spectacle blinds, switches and blocking devices. The tag should identify the person who applied it, the reason the tag was applied, and the date the tag was applied.
- Tags may be color-coded to identify the group which owns them. Color-coding of tags should be consistent with the color-coding of padlocks.
- Tags may be multi-part so that sections can be torn off and retained in a control room or other central location.
- Tags should be clearly mark, weather resistant and contain an eyelet so they can be fastened to equipment with a tie-wrap or wire.
- Tags should be multi-lingual as needed to communicate information and potential hazards to the local workforce.

3.3 Bar Clips

Where multiple padlocks are required at a single lockout point, bar clips (multi-lock hasps) or similar devices should be used.

3.4 Chains

Chains may be used with padlocks to secure valve handles or other equipment.

3.5 Blind Flanges, Skillets and Spectacle Blinds

Appropriate blind flanges, skillets and spectacle blinds should be provided at each facility to ensure that LOTO can be performed safely. They must be rated (working pressure and size) for the lines and process conditions where they will be used.

3.6 Built-In and Customized Energy Isolating Devices

New equipment should be designed with appropriate built-in isolation devices so that LOTO padlocks can be easily installed. Older equipment might require the use of customized attachments (e.g., special lockout bars, hasps to cover operating buttons, sliding-rod devices which can be extended and locked in position to prevent operation of control handles) so that padlocks can be attached.

3.7 Machine or Equipment Shutdown

The equipment should be shut down using its normal operating controls (i.e., depress stop button, open switch, close valve, etc.). The nearest operating control device should be used for this shutdown.

4. ENERGY ISOLATION – LOCKOUT / TAGOUT PROGRAM

Site-specific LOTO procedure should be developed locally to ensure consistency with local management systems and operating practices. Local procedures should specify the responsibilities of personnel involved in Lockout and Tagout Procedures, and describe how each will be accomplished:

- establish procedures for controlling energy in areas where there is a potential for an uncontrolled release of energy
- conducting periodic inspections to ensure that LOTO procedure is being followed
- training personnel about the purpose, function and restrictions of the LOTO program
- informing contractors about the LOTO procedure
- obtaining information from contractors on the contractor’s LOTO program

For a program to be effective and consistently applied, policies, procedures and responsibilities should be documented. Such a written program for control of hazardous does not need to be a lengthy or complex document. A template for a written LOTO program is provided in Appendix A.

The program should be reviewed at regular intervals and when there is reason to believe that measures taken may not protect personnels.

4.1 Electrical Isolation

- Equipment should be carefully reviewed to ensure all electrical energy sources have been identified.
- Equipment should be isolated from electrical energy sources by the opening and locking of all main power supplies. If the main power supply cannot be locked out, the equipment should be physically disconnected from power sources by a qualified electrician. Lockouts of local switches may leave other portions of the equipment energized. Special attention should be given to equipment connected to alternate power sources.
- Large capacitors should be discharged.
- After the equipment has been isolated from the main power supply, local electrical switches and start/stop stations should be activated to confirm the isolation is complete, then turned back off and tagged “Do Not Operate”.

4.2 Mechanical Isolation

- Potential sources of mechanical energy (e.g., pressurized fluids, springs, elevated components, rotating equipment and gears) should be neutralized or physically blocked out before work starts, to prevent unintentional energizing or movement of equipment. Examples include:
  - Bleeding down and/or isolating process fluid, steam, air, or hydraulic lines and cylinders.
  - Blocking out gears and other mechanisms.
  - Placing dies, lifts, or any equipment that might descend, slide, fall or roll in their “zero energy” or neutral position (typically the lowest position), or installing
  - physical blocks to prevent equipment from moving.
  - Releasing coiled springs and any spring-loaded devices.
  - Chaining rotating equipment.
- The preferred method for mechanically isolating equipment from process lines is disconnecting the lines and installing blind flanges, skillets or spectacles blinds.
- Blind flanges, skillets and spectacle blinds must be rated (working pressure and size) for the lines and process conditions where they will be used.
- Double block and bleed may also be used to isolate equipment from process lines.
- Bleed lines should be carefully checked to ensure they are not plugged and that any seepage from the bleeder is readily and safely detectable.
- Isolation by use of a single block valve is generally not acceptable. Exceptions should be made only under carefully controlled and supervised conditions.
- All valves used for mechanical isolation should be locked out, either on the valve body or by use of a chain through the handle.
- Mechanical isolation in preparation for confined space entry must be achieved by installation of blind flanges or skillets, or disconnection and removal of all associated lines.

5. HAZARD EVALUATION

The purpose of a hazardous energy control program is simply to evaluate and minimize or eliminate the chance that a worker may be injured while working on a piece of equipment that has not been de-energized prior to repair or maintenance.

Examples of hazards that may be present in geothermal operations for which energy control devices may be effective include:

- electrical energy
- heat energy
- substances under pressure
- mechanical energy
- stored energy
- hydraulic energy
- corrosives
- flammables

Before equipment is turned off or shut down, workers should determine the type, magnitude and the hazards of the energy associated with the machine or equipment to be serviced and/or maintained.

The worker should notify all affected personnel of the work to be performed.

6. HAZARDOUS ENERGY CONTROL STEPS

In addition to the hazard evaluation or preparation for shutdown, the following steps should be followed relative to hazardous energy control:

- machine or equipment shutdown
- isolation of equipment
- control and relief of stored energy
- application of LOTO devices
- verification of equipment isolation
- performance of scheduled work
- removal of LOTO devices to restore equipment to normal operation

7. APPLICATION OF LOCKOUT / TAGOUT DEVICES

A lock and tag should be attached to the energy isolating device by the Personnel performing the servicing or maintenance.

Lockout (individual locks or group locks with clasp or clip type devices) and/or tagout devices, whichever applies, should be attached to each hazardous energy / substance isolating device by the Personnel(s) performing the servicing or maintenance. No Personnel should place a personal LOTO device for another personnel. Lockout devices should be attached in a manner that will secure the hazardous energy / substance isolating devices in a "safe" or "off" position.

Tags with a "DANGER" legend should be attached to the shackle of the lock. The tag should include the name of the Personnel applying the device. Use of both LOTO is the preferred method for ensuring de-energization of equipment during servicing and/or maintenance activities.

In cases where lockout cannot be accomplished due to equipment design, tags should be used to isolate the equipment. A tagout should not be considered, in any way a lockout. If a tagout is the only means of isolating equipment, then the site supervisor or the individual senior to the individual responsible for managing the equipment isolation or energy control procedures should sign off before proceeding with the tagout. In situations where a piece of equipment cannot be locked out, modifications to allow positive lockout should be made immediately.

7.1 Control / Relieve Stored Energy

All potential hazardous stored or remaining energy (such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure) should be relieved, disconnected, controlled, blocked, drained, repositioned, and/or otherwise determined safe.

If there is a possibility of re-accumulation of stored energy to a hazardous level, verification of isolation should be continued until the servicing or maintenance is completed or until the possibility of such accumulation no longer exists. The frequency of the verification should be based on knowledge of the hazard and should be established before the operation begins

7.2 Verification of Equipment Isolation

After determining that no Personnel are exposed, the Personnel conducting the LOTO should confirm that the energy source has been disconnected or isolated as defined under "Isolation of Equipment" in this Section. This must be done prior to initiating work (by attempting to energize or making certain the equipment will not operate). The operating controls should be returned to "neutral" or "off" position after completing the "isolation" test (this is done to ensure that upon completion of the LOTO maintenance job, that the machine does not "spontaneously" start-up upon being re-energized).

7.3 Perform Scheduled Work

With the LOTO device applied, the machine or equipment is ready for work to proceed. The lock and tag must remain in place until the work is completed.

In situations in which LOTO must be temporarily removed from the hazardous energy/substance isolating device to test the machine/equipment, the procedures outlined below should be followed:

- The machine should be cleared of tools and equipment;
- Personnel should be cleared from the area;
- The lockout devices should be removed;
- The machine should be energized and tested;
- The work or test shall be performed;
- In returning to the lockout/tagout condition, the above energy control measures should be followed.

7.4 Removal of the Lock and Tag to Restore Equipment to Normal Operation

After the servicing and/or maintenance work is completed and the equipment is ready for normal operations, the Personnel should confirm that all work is completed and the equipment is ready for startup. The Personnel should then check the area around the machine or equipment to confirm that all tools have been removed, safeguards are in place, and that all Personnel have been safely positioned or cleared from the area.

The lock and tag should be removed by the same personnel who installed the devices (except as noted below). Finally, all affected personnel should be advised that the servicing is complete and equipment is ready to use.

Under normal circumstances, the lock and tag should only be removed by the personnel who installed it.

When removal by someone else is necessary, the steps listed below should be followed:

- The removal of a lock and tag should be done only under the direction of the Supervisor in charge of the job after they have confirmed that it is safe to remove the device.
- The Supervisor should verify that the Personnel who applied the device is not at the facility.
- The Supervisor should ensure that the Personnel has been informed of the removal of the device before he/she resumes work at the facility.

7.5 Tagout Only Procedures

Tagout procedures alone are only used when a hazardous energy/substance isolating device is not capable of being locked out. In addition to the procedures identified for LOTO, the measures below should also be used.

A standardized tag should be used.

Additional measures shall be considered to make the protection afforded by the tagout procedure equivalent to that provided by the lockout procedure. These include, but are not limited to, removal of a valve handle, the blocking of a controlling switch, or the opening of an extra disconnecting device.

The tag should be attached directly to the hazardous energy / substance-isolating device. If not possible, the tag should be located as close as safely possible to the device.

The tag should be attached in such a manner as will clearly indicate that the operation or movement of hazardous energy / substance isolating devices from the "safe" or "off" position is prohibited. The language on the tag should include the phrases "Do Not Start", "Do Not Open", "Do Not Close", "Do Not Energize", or "Do Not Operate". The tag should identify the person who applies it.

The tag should be able to resist wear and the environment to which it is exposed, and it should be secured so that it cannot be accidentally separated during use.

The tag attachment mechanism shall be non-reusable, attachable by hand, self-lockable, non-releasable

7.6 Procedure Involving More Than One Person

When servicing and/or maintenance work is performed by more than one authorized Personnel, one of the following procedures shall be followed as applicable (Group lockout for a small number of authorized Personnel):

- Primary authorized Personnel should be designated as having overall LOTO responsibilities. This designation may be changed (for example, if the designated person completes his/her portion of the work and leaves), provided that all affected Personnel are notified of the change in advance. The primary authorized Personnel should identify all of the authorized Personnel involved in the servicing/maintenance operation.
- A multiple lockout device shall be used on each piece of equipment locked out, and each authorized Personnel shall provide for his/her own protection by attaching a tagged lock to the multiple lockout device.
- Individual authorized Personnel shall remove their own lock(s) when they (or their crew) stop working on the facility, or depart from the job (i.e., at shift end or conclusion of work assignment).

7.7 Lockboxes

A lockbox procedure may be used when multiple energy sources and/or a group of personnel are involved in maintenance or repair operation.

Under a lockbox procedure the primary authorized personnel should place a LOTO device upon each hazardous energy / substance isolation device. The keys from these locks should then be placed inside a lockbox. Each authorized Personnel assigned to the job should then place his/her personal lock on the lockbox.

As a member of a group, each assigned authorized personnel should verify that all hazardous energy has been isolated and released of energy.

The LOTO devices should not be removed or the hazardous energy / substance device(s) activated until after each authorized personnel has removed his/her lock from the lockbox and the LOTO device(s) are removed.

When the maintenance work extends beyond one shift, a job- lock should also be attached to the lockbox

7.8 Job-Locks and/or Tags

Job-locks or tags may be used by the supervisor(s) of the authorized personnel to provide continuity of energy / substance isolation from shift to shift as applicable to the circumstances of the job.

To achieve job lockout, the supervisor should place a lock on the equipment and leave it on the lockout device for the duration of the job. The Supervisor or his/her relief shall maintain possession of the key.

Each authorized personnel should place his/her lock on the lockout device upon coming onto the job requiring lockout or tagout, and remove his/her lock or tag whenever he/she departs the job (at shift end or conclusion of the work assignment).

Job-locks or tags shall be removed only after all authorized personnel have released the equipment and the job has been completed or is being temporarily energized for other purposes

7.9 Shift or Personnel Changes When Job-Locks Are Not Used

When an off-going authorized personnel transfers servicing duties to an on-coming authorized Personnel (relieving in the presence of each other on the job during a shift change), the on-coming personnel should install his/her LOTO device as soon as the off-going personnel removes his/her lock.

When an off-going authorized personnel transfers servicing duties (during a shift change) to an on-coming authorized personnel by removing his/her LOTO device before the on-coming authorized personnel arrives, the personnel should observe the following procedures:

- The off-going authorized personnel should apply an interim tagout device at the time he/she removes his/her device.
- The interim tagout device shall indicate that the off-going authorized personnel's lock has been removed but the machine or equipment has not been re-energized, depressurized.
- The on-coming authorized personnel should verify that the system is still de-energized or depressurized and shall remove the interim tag and substitute his/her LOTO device.

When interim tagout device(s) are used in lieu of lockout device(s), the following procedures should be used:

- A tag should be used with spaces for the off-going authorized personnel to sign, giving the date, time, and location and for the on-coming authorized Personnel to sign, giving the date, time, and location.
- The off-going authorized personnel should transfer his/her servicing duties to the on-coming authorized personnel by signing off in the appropriate spaces on the tag.
- The on-coming authorized personnel should sign on the tag, giving the date, time and location he/she assumes servicing duties on the tag.
- Each authorized personnel should verify the de-energizing and energy isolation of the equipment for his/her own protection before signing on the tag.

7.10 Valve Lockout Procedure

The personnel who is to work on the equipment should turn the valve to the closed position and lock it with a chain and padlock (or other locking device) so it cannot be moved to the open position.

The personnel locking out the valve shall complete and attach the identification tag to the lock shackle.

After the work is completed, lock and tag should be removed only by the Personnel who locked out and tagged out the valve. If circumstances require someone else to remove the lock/tag, its removal should be done under the direction of a supervisor, and then only after a careful inspection of the work area and the equipment (which is locked out) has been made.

7.11 Blinds

Blinding is considered to be equivalent to locks for the purpose of de-energizing equipment or machines.

Pipelines should be assumed to be under pressure regardless of precautions taken. As far as feasible, pipelines should be physically traced to determine the sources of pressure that need to be blanked off. A check valve should not be depended upon to prevent back flow in a pipeline.

Valves should be locked out both upstream and downstream of the work area. The concern is to prevent a hazardous energy or flammable fuel / gas / toxic mixture from being present inside the pipeline.

The pipeline should be drained. Personnel should not stand in front of valves, connections, bull plugs, gauges or chokes while they are being removed, even if pressure has been relieved. If a section of pipe is to be removed temporarily, the pipeline should be blinded.

Blinds placed on pipelines should be tagged following tagout procedures.

7.12 Cord and Plug Connected Electrical Equipment

LOTO should not apply to cord and plug connected electrical equipment if the equipment is unplugged and the plug is in the exclusive control of the personnel who is performing the servicing or maintenance of that equipment.

The cord and plug is considered to be within the personnel's control if it is in arm's reach and in line of sight of the Personnel or is otherwise under his/her physical possession.

If the cord and plug is not within the personnel's sight or physical control, a LOTO device shall be attached to the cord and plug in such a way that it shall not permit the plug to be inserted into the outlet.

8. PERIODIC INSPECTIONS

Inspections of the LOTO procedure should be conducted by Supervisors to determine that the procedures are being followed. These inspections may be completed through random audits and planned visual observations. The frequency of these inspections conducted by the Supervisor should cover at least 20% of all LOTO jobs, and no less than one inspection per year.

The inspections should:

- Be performed by an personnel other than the one utilizing the energy control procedure being inspected
- Provide for a demonstration of the procedures and correct any deviations or inadequacies observed
- Where tagout alone is used for energy control, include the personnel in discussion of his/her responsibilities under the energy control procedure being inspected, and the limitations of tags.

All supervisor inspections should be documented. The documentation should include the date, location, verification that all deficiencies were corrected and the "inspector's" name.

9. PERSONNEL TRAINING

Unless English is the operational language of the facility or area of operation, training should be conducted in the local language.

All personnel who may work in an area where energy control procedures could be used must receive training in the purpose, function, and restrictions of the LOTO procedure. Particular attention should be placed on the hazard evaluation component, including recognition of applicable hazardous energy sources, the type and magnitude of the energy present in the workplace, and in the methods and means necessary for energy isolation and control.

When tagout is used alone, all personnel shall receive training as previously discussed plus training in the limitations of tags.

All personnel who receive initial training on LOTO procedure should receive retraining on a periodic basis.

All training should be documented. The documentation should include personnel's names and dates of training.

10. CONTRACTOR RELATIONS

Whenever contractor personnel are to perform servicing and/or maintenance work on machines and equipment, the facility supervisor and a contractor representative should inform each other of their respective LOTO procedures. Contractor LOTO procedure should provide a level of protection at least equal to that of the facility program.

When facility and contractor personnel are working together, the facility LOTO system should be used. If not, the facility supervisor should ensure that facility personnel understand and comply with the restrictions and prohibitions of the contractor's LOTO procedures.

Contractors using their own LOTO procedures should provide evidence of training to the facility.

Appendix A
Hazardous Energy Control Program

Date: _________________ Area / Location: _________________________________

Person Responsible For Hazardous Energy Control Program

Name: ____________________________ Job Title: ________________________

Machine / Equipment Type

List types of equipment where these same procedures would apply (i.e., equipment of the same type with similar energy sources)

____
____
____
____
____

Location of Equipment:

____
____
____
____
____
____

Energy Controls

Identify and describe the types of energy controls in use and their capability of being locked out.

Types of Energy Controls:

____
____
____
____

Energy Sources and Controls

Check and/or list energy type and magnitude for this equipment:

Electrical___________ Steam____________ Hydraulic____________
Air powered__________ Natural Gas____________ Other___________

Can the machine be locked out at the main energy source? ___

Stored energy sources:

Identify Energy Sources Type and Magnitude) and Location:	Lockable? Yes or No	Type Lock/Block Device Needed

Shutdown / Lockout Procedures

List, in order, the steps necessary to shut down and de-energize the equipment. Be specific. List the control type and location. For stored energy, be specific about how the energy will be released or controlled

NOTE: Notify affected Personnel whenever these procedures will be completed.

Shutdown (What control applied & Location of the control):

____
____
____
____
____

Isolation (What control applied & Location of the control):

____
____
____
____
____
____
____

Lockout / Tagout (What control applied & Location of the control):

____
____
____
____
____

Control / Relieve Stored Energy (What control applied & Location of the control):

____
____
____
____
____

Verify Equipment Isolation (What controls shall be tested):

____
____
____
____
____

Start Up Procedure

List steps necessary to remove lockout / tagout devices and re-activate (energize) the equipment. Personnel must be clear of area during any testing or activation.

<u>**NOTE**</u>**:**
Lockout / tagout devices to be removed by or with the approval of the authorized Personnel who installed them or, if necessary, under the direction of the supervisor in charge of the job.

Lockout / Tagout Removal:

____
____
____

Start Up Procedure:

____
____
____

Procedures Involving More Than One Person

List the procedures that will be used if more than one person is involved in the LOTO work. One or more of the following categories may apply.

Group Lockout:

____
____
____
____

Lockbox:

____
____
____
____

Job Locks and/or Tags:

____
____
____
____

Shift or Personnel Changes:

____
____
____

Outside Personnel and Contractors:

____
____
____

Alternate Procedures

List those operations where the procedures do not apply (such as in tagout only, etc.). Alternate measures that provide effective protection must be developed for these operations.

____
____
____
____
____
____
____
____
____

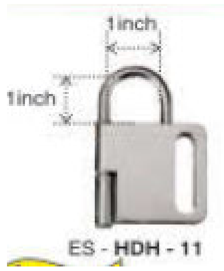
Affected and Authorized Personnel

List each person affected by this procedure and those authorized to use this procedure.

Affected Personnel's Name	**Occupation / Job Title**	**Location**
Authorized Personnel's Name	**Occupation / Job Title**	**Location**
Other Personnel's Name	**Occupation / Job Title**	**Location**

Appendix B
Lockout Equipment Examples

Description	Illustration
Safety Lockout - vinyl-coated, high-tensile steel - plated to resist rust - accepts six padlocks up to 3/8" shackle diameter - OSHA standard 1910.123(b5) for machine guarding	
Padlock (Colored Bumper) - laminated steel body - pin tumbler lock - double-locking, case-hardened steel shackle - pair of keys - each lock keyed differently - shackle: 9/32" diameter; 3/4" vertical & 5/8" horizontal clearance / - 1 1/2 " wide body	
Identification Tags and Collars - Allows instant identification - Designed to withstand rugged work environment - Tags can have names and numbers inscribed, painted, or stamped - 1 3/4" long; 1/2" wide	 ES - CUS TAGS  ES - METAL TAGS CIRCULAR
Optional 9" Chain Attachments - permanently attach lockouts at pre-designated control and valve sites	

Description	Illustration
Safety Lockout - Aluminum with red poly resin coating for greater visibility - Protection for electric, gas, water, steam, acid, and pneumatic control units and levers - Round design of hasp prevents engagement of circuit breaker boxes and disconnect switches - Accepts up to 3/8" shackle diameter - OSHA standard 1910.123(b5) for machine guarding	 
Safety Lockout - Heavy duty steel with 1/4" shackle size solid steel U bolt - 0.060 malleable steel lock plate makes vandalism and accidental breakage virtually impossible - Ideal for chemical, food, pharmaceutical and other process industry applications - Accepts up to 3/8" shackle diameter - OSHA standard 1910.123(b5) for machine guarding	 
Color-coded padlocks - Aluminum body with anodized finish - Case-hardened steel, chrome-plated shackle and cover plate - Double ball locking system - Six colors - [B=blue, D=duranodic (brown), E=green, G=gold, K=black, R=red] - Each lock keyed differently - 3/4" thick body	
E-Safe Lock-A-Plug Practical and positive protection - Encompasses the plug - Hole on one end for cord feed - Strong poly pro material - Totally dielectric - Sliding closure - Integrated multiple lockout **Model LP110** - Accepts any 110 volt plug - Maximum plug size 2" x 2" x 3 1/2" - Maximum cord diameter 3/4" **Model LP550** - Accepts any 220 or 550 volt plug - Maximum plug size 3 1/4" x 3 1/4" x 7" - Maximum cord diameter 4"	 LP550  LP110

Description	**Illustration**
V-Safe Valve Cover The V-Safe valve cover consists of two flattened half-moons that completely cover the valve, made of nearly indestructible plastic**.** - excellent dielectric properties. - excellent resistance to solvents. - non-cracking - resistant to extreme temperature changes	

Standard Tagout Devices

APPROVAL

	POSITION	NAME	SIGNATURE	DATE
Prepared by	SHE Engineer	Erwin Patrisa Floris		
Reviewed By	Sr. SHE Manager	M. Arief Tarunaprawira		
Approved By	VP Relations & SHE	Priyandaru Effendi		17/05/2013

REVISION HISTORY

REV	DATE	BY	REVIEWED	APPROVED	DESCRIPTION
0					For Use

TABLE OF CONTENTS

1. INTRODUCTION

In order to manage the health and safety of personnel at a facility effectively, an organization has to be able to identify, assess and control hazards which have the potential to cause harm or damage.

This procedure sets out the actions necessary to ensure that all hazards with a potential to cause harm or damage are systematically identified at SUPREME ENERGY's sites. The level of risk of each hazard is determined at each site. Controls are then implemented to eliminate, isolate, or minimize the hazard.

2. RESPONSIBILITIES

The site's Safety Health and Environment (SHE) Committee will implement a systematic hazard identification and assessment program specific to each individual site. The aim is to identify all hazards at the site and to introduce controls for those hazards. Typically these will be hazards inherent at the site and those caused by routine or normal activities. Non-routine work related hazards will usually be managed by the permit-to-work system.

Hazard identification and control is a shared responsibility between management and staff. Hazards will be systematically identified by examining specific areas of the work site and the activities carried out in them.

Designated staff and management are to review their work areas to consider the potential hazards present. The risk posed by the hazards identified will be evaluated and appropriate control measures developed.

The Safety Health Environment (SHE) Representative is responsible for updating and maintaining the Hazard Identification Register.

3. DEFINITIONS

Consequence
The outcome of an event or situations expressed qualitatively or quantitatively, being a loss, injury, disadvantage or gain.

Frequency

A measure of likelihood expressed as the number of occurrences of an event in a given time.

Hazard

A source of potential harms or damage or a situation with potential harm or damage.

Hazardous Material

A liquid, solid,or gas that may result in a physical and/or a chemical hazard. A physical hazard is used to describe the flammable, toxic, corrosive, or reactive hazards of a material. A health hazard refers to the acute or chronic health effects of a material.

Likelihood

A qualitative description of probability and frequency.

Probability

The likelihood of a specific outcome, measured by the ratio of specific outcomes to the total number of possible outcomes.

Risk

The measure both of the likelihood (frequency) and the consequences (severity) of a specified untoward event caused by an identified hazard.

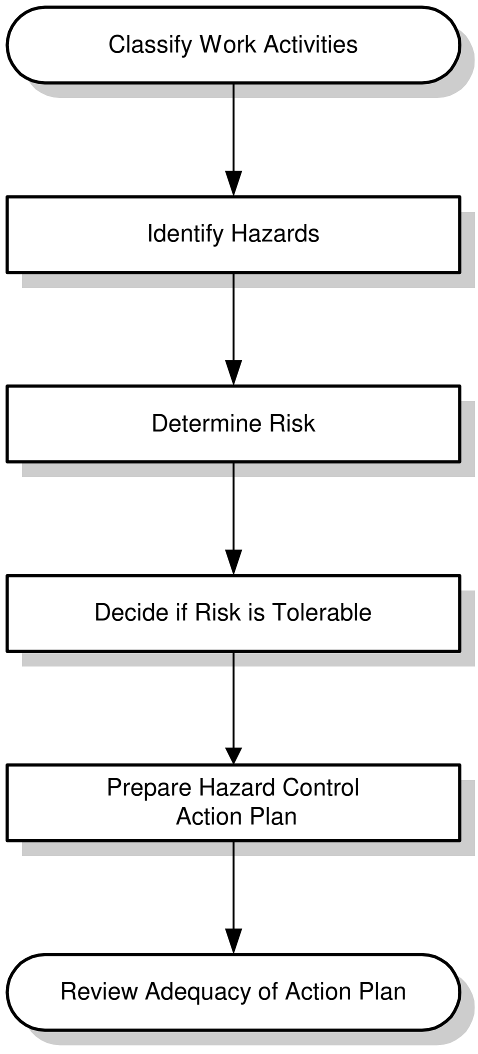
4. STEPS IN A HAZARD MANAGEMENT PROGRAM

The steps required in order to carry out an effective Hazard Management Program are presented in Figure 4.1 and are listed below:

- Classify work activities: prepare a list of work activities covering premises, plant, people and procedures, and gather information about them;
- Identify hazards: identify all significant hazards relating to each work activity. Consider who might be harmed and how;
- Determine risk: make a subjective estimate of risk associated with each hazard assuming that planned or existing controls are in place. Assessors should also consider the effectiveness of the controls and the consequences of their failure;
- Decide if risk is tolerable: judge whether planned or existing precautions (if any) are sufficient to keep the hazard under control and meet legal requirements;
- Prepare risk control action plan (if necessary): prepare a plan to deal with any issues found by the assessment to require attention. Organizations should ensure that new and existing controls remain in place and are effective;
- Review adequacy of action plan: re-assess risks on the basis of the revised controls and check that risks will be tolerable.

Note: The word “tolerable” here means that risk has been reduced to the lowest level that is reasonably practicable (the As Low As Reasonably Practicable ALARP Principle).

Figure 4.1 Steps in a Hazard Management Program



5. HAZARD IDENTIFICATION

5.1 Hazard Categories

To help with the process of identifying hazards, it is useful to categorize hazards by types. Some examples are listed below:

- Physical hazard: Substance capable of causing damage from physical effects of excessive pressures, fires, explosions, and chemical reactions, such as:
  - Compressed gases
  - Combustible liquids
  - Explosive, flammable, pyrophoric, unstable and reactive substances.
- Chemical Hazards: Chemicals can affect the skin by contact or they affect the body either through the digestive system or, via the lungs if air is contaminated with chemicals, vapor, mist or dust.

  There can be an acute effect, (i.e. the person is affected immediately), or there can be a chronic effect, (i.e. the person is affected in the medium to long term).
- Noise Hazards: Excessive noise can disrupt concentration, interfere with communication and result in loss of hearing. High impact noises are particularly damaging. Noise can also mask out signals, adversely affecting communication.
- Radiation Hazards: Ionizing radiation is in such equipment as radioactive gauging devices, radiographic sources, or the radioactive trace elements used in analytical chemistry. Non-ionizing radiation covers infra-red radiation (heat producing processes), lasers, ultraviolet radiation (welding, sunlight), and microwaves (high frequency welders, freeze drying).
- Electrical Hazards: This covers the risk of injury from all forms of electrical energy.
- Lighting Hazards: Inadequate lighting levels are a potential safety hazard. A common problem area is the reaction time needed for the eyes to adjust from a brightly lit to a darker environment. Temporary lighting is often inadequate.
- Vibration Hazards: This includes whole-body vibration - e.g. truck drivers, people standing on vibrating platforms, and operators of mobile equipment - and also segmental vibration effects from such equipment as hand tools, chainsaws and pneumatic hammers.
- Temperature Hazards: Extremes of cold or heat can cause problems due to individual fatigue or reduced capacity to work.
- Biological Hazards: These include insects, bacteria, fungi, plants, worms, animals and viruses.
- Ergonomic Hazards: This covers risk of injury from manual handling procedures, incorrectly designed work stations, audio and visual alarms, and color coding control mechanisms.
- Physical Hazards: This includes a wide range of risks of injury - as diverse as being caught in or by machinery, buried in trenches or hurt by collapsing machinery. This category also includes the hazards from working in confined spaces, being hit by flying objects, caught in a jet stream, falling from heights and tripping on obstacles.

- Miscellaneous Hazards: This includes stress, fatigue, the effect of shiftwork, and even assaults from other people.

5.2 Hazard Identification

There are three fundamental methods of hazard identification applicable to various workplace circumstances.

Hazard Identification by Area

Fixed workplaces are ideally suited to hazard identification by area which involves grouping hazards into common types and identifying them by surveying in detail the different parts of the workplace.

An outline of steps in the process is given below.

(a) Obtain an up-to-date and accurate plan of the workplace.

(b) Draw up a diagram to show the movement of people or plant.

(c) Divide the workplace into discrete areas and number them. This division can be based on how work is carried out or on the physical layout of the site. Thus, for example, a power plant on it might contain a stores area, a plant area, workshops, offices, control room and switch rooms.

(d) Ask staff in each identified area to list what they consider is the hazards in the places they work and why they consider these to be hazards or potential hazards. Use a data collection form for information gathering.

Note**:** Process of hazard identification should be **audited**. Therefore, an audit trail established, with information clearly recorded.

(e) It is recommended that a meeting be held to fill in the data sheets rather than just handing them out. It is also important that judgments as to the likelihood that harm would result from the hazard are not made at this time.

(f) To further assist the hazard identification process makes use of all available information. This can come from the following sources: codes of practice, pamphlets, booklets, regulations, manufacturers' information material, in-house and external reports, complaint details, environmental and health monitoring reports, etc. Use can also be made of records and reports on accidents and "near misses", both at the particular workplace and more generally within the industry itself.

Hazard Identification by Task Analysis

Work that is not done at a fixed workplace is better analyzed by first identifying the different type of work involved and the tasks that people are called on to perform, and then the hazards they face in doing these tasks can be identified. This method is well suited to those work activities where there is considerable scope for the workers themselves to decide how the task will be carried out.

This analysis method is applicable to such work as maintenance, construction and similar activities where people tend to work in small autonomous groups with minimal supervision. A major problem with this type of approach is that hazards that are not part of a particular person's work tasks will not be identified by that person.

Steps included in the process are listed below:

(a) Identify all the tasks that people carry out. A task consists of a number of steps, actions or stages performed in order to complete a specific work assignment. The task identification process can initially be done by asking people what they specifically do. The work should be broken down into small enough components to be analyzed, but not so small as to make the analysis impractical. A task breakdown of the work carried out may already exist, for example from the development of a quality assurance system.

(b) Discuss and then list the steps or stages involved in performing each task.

(c) Ask those involved what hazards they consider apply to each identified step, and record these.

(d) To assist the hazard identification process, use of all available information.

Hazard Identification by Process

A more technical approach to hazard identification is to identify the processes involved at a work site and then go through each process step-by-step, identifying the hazards in each element of the process. The time taken to identify individual potential hazards in this way can be longer than the time taken to quantify the risks of these hazards.

Steps in this method are listed below:

(a) Make an inventory of all substances and/or chemicals used in the process.

(b) Outline the process from start to finish (source to sink). Identify the steps where process fluids are transformed by physical or chemical means.

(c) Draw up a flow chart detailing every step of the process (including waste streams) and setting out the various stages where chemicals and substances are used in the process.

(d) Identify all the hazards at each of the process.

(e) To further assist the hazard identification process, make use of all available information.

5.3 Hazard Identification Register

A detailed list of the hazards identified shall be prepared clearly linking delineated hazards to specific work areas, specific workplace activities or specific processes within the workplace. Information that needs to be recorded to allow the next stage of the process to be undertaken (risk assessment) includes:

- the exact location, activity or process of the hazard.
- determining who could come into contact with the hazard.
- when and how likely they are to come in contact with the hazard.
- how often (frequency).

- the consequence of coming into contact with the hazard, e.g. the worst case with no controls.

All the information obtained should be recorded on the Hazard Identification Register Form 5.1. These forms will form the basis of the Site Hazard Identification Register and will be available for all personnel at the site to view.

In addition, hazards may be added to the register, via a Safety Alert Card.

Form 5.1

Hazard Identification Register

Area/Activity/Process______________________________ **Staff Member** __________________________________

Hazard Type __________________________________ **Date** __________________________________

Hazard Description	Location of Hazard	People Who Could be Exposed	When/How/Why/ How Often?	Consequences	Action Taken/Date

6. RISK ASSESSMENT

6.1 Determine Risk

The risk from the hazard should be determined by estimating the potential severity of harm (consequence) and the likelihood that harm will occur.

Severity of Harm

Information obtained about work activities is a vital input to risk assessment. When seeking to establish potential **severity of harm**, the following should also be considered:

(a) part(s) of the body likely to be affected
(b) nature of the harm, ranging from slightly to extremely harmful:

(i) slightly harmful, e.g.
- superficial injuries; minor cuts and bruises; eye irritation from dust;
- nuisance and irritation (e.g. headaches); ill-health leading to temporary discomfort;

(ii) harmful, e.g.
- lacerations; burns; concussion; serious sprains; minor fractures;
- deafness; dermatitis; asthma; work related upper limb disorders; ill-health leading to permanent minor disability;

(iii) extremely harmful, e.g.
- amputations; major fractures; poisoning; multiple injuries; fatal injuries;
- occupational cancer; other severely life shortening diseases; acute fatal diseases.

Likelihood of Harm

When seeking to establish likelihood of harm, the adequacy of control measures already implemented and complied with, needs to be considered. Here legal requirements and codes of practice are good guides covering controls of specific hazards.

The following issues should then typically be considered in addition to the work activity information:

(a) number of personnel exposed
(b) frequency and duration of exposure to the hazard
(c) failure of services e.g. electricity and water
(d) failure of plant and machinery components and safety devices
(e) exposure to the elements (flooding, high winds, sun, etc)
(f) protection afforded by personal protective equipment and usage rate of personal protective equipment
(g) unsafe acts (unintended errors or intentional violations of procedures) by persons, for example, who:
(i) may not know what the hazards are
(ii) may not have the knowledge, physical capacity, or skills to do the work
(iii) underestimate risks to which they are exposed
(iv) underestimate the practicality and utility of safe working methods.

It is important to take into account the consequences of unplanned events.

These subjective risk estimations should normally take into account all the people exposed to a hazard. Thus any given hazard is more serious if it affects a greater number of people. But some of the larger risks may be associated with an occasional task carried out just by one person, for example, maintenance of inaccessible parts of the plant.

6.2 Decide if Risk is Tolerable

Table 6.1 shows one simple method of estimating risk levels and for deciding whether risks are tolerable. Risks are classified according to their estimated likelihood and the potential severity of harm.

Table 6.1 A Simple Risk Level Estimator

	Slightly Harmful	Harmful	Extremely Harmful
Highly Unlikely	**Trivial Risk**	**Tolerable Risk**	**Moderate Risk**
Unlikely	**Tolerable Risk**	**Moderate Risk**	**Substantial Risk**
Likely	**Moderate Risk**	**Substantial Risk**	**Intolerable Risk**

Note: Tolerable here means that risk has been reduced to the lowest level that is reasonably practicable.

7. HAZARD CONTROL ACTION PLAN

7.1 Prioritizing Actions

Risk categories shown, for example in Table 7.1, form the basis for deciding whether controls or improved controls are required to reduce the risk from an identified hazard to acceptable levels.

To establish a prioritization (timescale for action) list an approach is shown in Table 4.2, which shows that control effort and urgency should be proportional to risk.

Based on this approach, an inventory of actions, in priority order, to devise, maintain or improve controls, can be developed and implemented.

Table 7.1 A Simple Risk-Based Control Plan

Risk Level	Action And Timescale
Trivial	No action required and no documentary records need to be kept.
Tolerable	No Additional controls are required. Consideration may be given to a more cost-effective solution or improvement that imposes no additional cost burden. Monitoring is required to ensure that the controls are maintained.
Moderate	Efforts should be made to reduce the risk, but the costs of prevention should be carefully measured and limited. Risk reduction measures should be implemented within a defined time period. Where the moderate risk is associated with extremely harmful consequences, further assessment may be necessary to establish more precisely the likelihood of the harm as a basis for determining the need for improved control measures.
Substantial	Work shall not be started until the risk has been reduced. Considerable resources may have to be allocated to reduce the risk. Where the risk involves work in progress, urgent action should be taken.
Intolerable	Work shall not be *started* or *continued* until the risk has been reduced. If it is not possible to reduce risk even with unlimited resources, work has to remain prohibited.

Note: Tolerable here means that risk has been reduced to the lowest level that is reasonably practicable.

7.2 Hazard Control Options

It is important when developing control options for identified significant hazards that all options are considered including reviewing the existing controls to ensure that the most effective controls are in place. Controls should be chosen taking into account the points listed below.

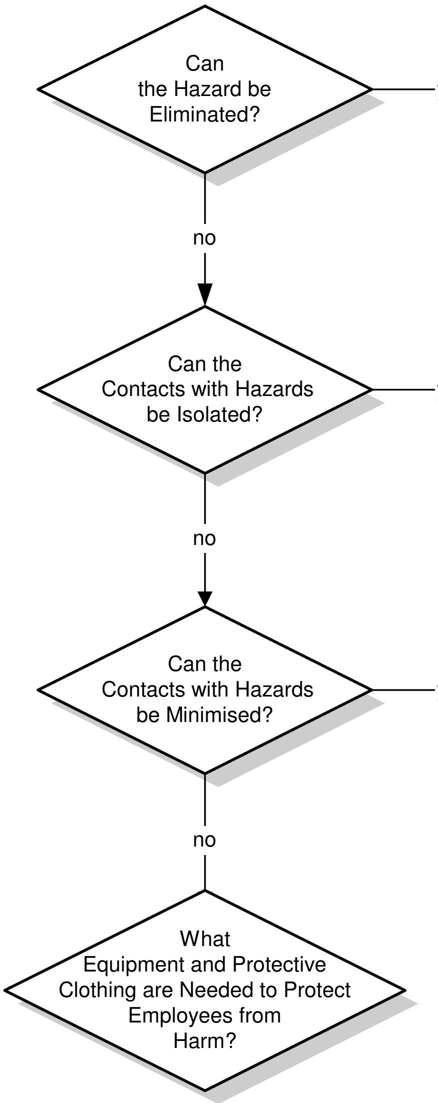
- If possible, eliminate the hazard altogether, e.g. substitute with a safer chemical for a more hazardous one
- If elimination is not possible, try to reduce the risk, e.g. by using a low voltage electrical appliance
- Enclose/isolate process or pieces of equipment

- Where possible, adapt work to the individual, e.g. to take account of individual mental and physical capabilities
- Take advantage of technical progress to improve controls
- Implement measures that protect everyone
- A blend of technical and procedural controls is usually necessary
- Consider the need to introduce planned maintenance of, for example, machinery safeguards
- Adopt personal protective equipment only as a last resort, after all other control options have been considered
- Review the need for emergency arrangements
- Pro-active measurement indicators are necessary to monitor compliance with the controls.

Consideration also needs to be given to the development of emergency and evacuation plans, and provision of emergency equipment relevant to the organization’s hazards.

A decision tree for deciding how a hazard can be controlled is presented in Figure 7.1.

Figure 7.1 Hazard Control Decision Tree



8. REVIEW ADEQUACY OF ACTION PLAN

The action plan should be reviewed before implementation, typically by asking these questions.

(a) Will the revised controls lead to tolerable risk levels?
(b) Are any new hazards created by the implementation of the proposed control?
(c) Has the most cost-effective solution been chosen?
(d) What do people affected think about the need for, and practicality of, the revised preventive measures?
(e) Will the revised controls be used in practice, and not ignored in the face of, for example, pressures to get the job done?

9. IMPLEMENTATION OF CONTROL OPTIONS

Once an appropriate control option has been decided on, it will be implemented and its implementation recorded in the Hazard Identification Register and a hazard control plan will be filled in, assigning responsibilities and a timeframe for the implementation of the control.

The frequency of inspection for each control will be based on the degree of risk the hazard represents.

10. PLANT FAILURES

10.1 General

Operations involving high energy systems require that the hazards presented by system and equipment failures are of particular concern. Plant hazard identification and control must start at the conceptual design stage and extend right through to decommissioning.

Most hazards not covered at the design stage will tend to be managed by operating procedures. Non-routine plant activities will usually be controlled by careful work planning and implementation.

10.2 Maintenance

The ongoing safety of plant and equipment is largely controlled by routine maintenance and prompt defect identification and rectification. To this end all safety-related maintenance is to be separately identified and monitored. It is of note that the term 'safety related maintenance (starred maintenance)' refers both to maintenance on safety equipment and safety systems, as well as systems and equipment if a failure occurred which could lead to hazards to personnel.

11. MANAGEMENT OF CHANGE

The management of hazards at a facility is a continuing process. The adequacy of control measures should be subject to continual review and changes made as if required.

If conditions change, (activity change, process change or new equipment) then the extent that hazards and risks are affected by the change should be reviewed and the risk assessment revised to take into account these changes.

12. HAZARDOUS AREAS

As part of the hazard control process, certain areas, because of the nature of hazards identified in that area, will have specific control measures. Areas designated as Hazardous Areas will be marked on a site layout map and warning signs erected to inform persons that the area is hazardous, has restricted access and is subject to specific work controls. The Site Safety Health Environment (SHE) Committee will establish appropriate rules for each designated Hazardous Area.

Hazardous Areas can include areas where there is the likelihood of flammable or toxic gases being present; high noise hazards, eg areas around a venting rock muffler or a safety valve's vent; high voltage areas, such as switchyards.

13. SAFETY ALERT CARDS

If SUPREME ENERGY employees, contractors or visitors in their work come across a hazard that they believe has not been identified, or a control measure that is deficient, a Safety Alert Card should be filled in and forwarded to the Site Safety Health Environment (SHE) Representative.

The Site SHE Representative will process the Safety Alert Cards received and raise them at the next site SHE Committee meeting for consideration. The actions decided on by the SHE Committee will be conveyed to the person who raised the Alert.

Safety Alert Cards are red cards which are located in small boxes attached to SHE Noticeboards throughout the site. A copy of the card is presented as Figure 13.1.

Figure 13.1 Safety Alert Card

SAFETY ALERT CARD

Date:

Time:

Work Area:

Hazard / Item:

Unsafe Condition:

supremeenergy	SAFETY HEALTH AND ENVIRONMENT HAZARD IDENTIFICATION & RISK ASSESSMENT	PROCEDURE
CORPORATE	JOB SAFETY ANALYSIS	SE-MSHE-HIR-PRO-0002 Revision: 0

APPROVAL

	POSITION	NAME	SIGNATURE	DATE
Prepared by	SHE Engineer	Erwin Patrisa Floris		
Reviewed By	Sr. SHE Manager	M. Arief Tarunaprawira		
Approved By	VP Relation & SHE	Priyandaru Effendi		**17/05/2013**

REVISION HISTORY

REV	DATE	BY	REVIEWED	APPROVED	DESCRIPTION
0					For Use

TABLE OF CONTENTS

1. INTRODUCTION

Many incidents have been related to the personnel not understanding the risk and hazards of the work they were performing. A key tool to identify these risks and hazards is the Job Safety Analysis JSA (also called Job Hazard Analysis or Task Risk Assessment).

This procedure uses the comprehensive safety process to describe the JSA implementation. The safety process itself covers five general areas:

- Purpose, Scope and Objectives
- Procedures
- Resources, Roles, and Responsibilities
- Measurement and Verification
- Continual Improvement

2. PURPOSE, SCOPE AND OBJECTIVES

2.1 Purpose

Job Safety Analysis (JSA) is the foundation that supports Incident Free Operations. It is a behavioral tool used to identify and minimize risk associated with routine and non-routine job tasks. When used in conjunction with the site processes, a JSA enables workers to minimize exposure to conditions that may cause injuries.

The JSA is an analysis of hazards associated with a specific job. To determine which jobs/tasks should be analyzed first, priority should be given to jobs with the highest rate of injuries or where "near misses" have occurred. Ultimately, a JSA should be conducted and made available for all jobs in the workplace.

A JSA studies each step of a specific job or procedure, identifying existing or potential job hazards, and determines the best way to perform the activity to reduce or eliminate these hazards.

2.2 Scope

This process is intended to discuss how to complete a Job Safety Analysis properly and thoroughly.

This JSA Process applies to company-owned facilities. Contractors on company property shall follow the Company JSA or, upon approval from the Company, may use their own JSA processes.

A quality JSA should assess each aspect of the task and identify items that could result in injury to personnel, pose a threat to the environment, or damage to equipment.

The basic steps for conducting the JSA are:

- Outline the sequence of events
- Identify hazards associated with those events
- Document steps to be taken to mitigate the identified hazards.
- Identify the person responsible to ensure mitigation steps are taken

To enhance the effectiveness of the JSA and for each analysis that takes place, the site observation is recommended to ensure that the plan outline is being followed. If events or conditions change from the original plan, the job shall be suspended until all parties involved review / revise the plan. Additionally, if new personnel arrive at the site once the job or activities have begun; those personnel shall review the JSA before beginning work and document such review.

2.3 Objectives

The intent of a JSA is to proactively identify and eliminate potential hazards and to help implement controls to eliminate or reduce the hazards, therefore helping to create a safe working area.

3. GEOTHERMAL AND POWER REQUIREMENTS

To comply with this process, the following requirements must be met:

1. Employees and business partners will be trained in Job Safety Analysis (JSA)
2. Understand basic safety health and environment
3. Understand JSA requirements

4. PROCEDURE

The JSA process falls into five sequential and important steps:

- Choosing the Job
- Selecting the Team
- Breaking the Job Into Component Tasks
- Identifying Hazards
- Developing Solutions

Each step should be completed before moving onto the next step.

4.1 Choosing the Job

Determining when and where a JSA is needed should follow a written guideline set up beforehand by a responsible person within the facility.

Jobs to be analyzed include any of the following conditions:

- <u>Historical high rate of incidents or near misses</u> - these jobs pose the greatest risk to the workers at that site and in adjacent areas. Close-calls and near misses indicate a problem in the procedure or the existence of some other unidentified hazard.
- <u>New jobs or jobs that have received a recent change in their operating procedures</u> - in this situation, workers may not be familiar with the new procedure or may not fully understand the conditions in which they are working.
- <u>Jobs that are done on an infrequent basis</u> - as evidence of the examples in the beginning of this document, these types of jobs are often not understood or possible risks not recognized.
- <u>Jobs identified as needing a procedural review</u>

It is important to recognize that these may not be the only situations where a JSA may be required. Other situations may arise where it will be necessary to complete an analysis of the job before conducting work. Some examples of work requiring a JSA include vessel entry and cleaning, hot work on process equipment, special procedures on process equipment, or entry into an inert atmosphere.

4.2 Selecting the Team

In order to fully understand the work being analyzed, it is very important to select the proper team members. Having the right people on the team is as important as doing the analysis itself.

Groups conducting a JSA should include :

- The person doing the job (controller or employee) - few people understand the details of a job like the person doing the work. The expertise and understanding brought forth by the worker in this case is invaluable.
- The supervisor of the area and workers in adjacent areas to the work being analyzed - including these workers is important for two reasons. They are able to demonstrate how the work fits into the entire process, and, any the hazards of one location can greatly impact the safety of other areas in the facility, especially areas that are near the hazardous location.
- Safety personnel - often times this person will facilitate the review.
- Specialists (such as mechanical / electrical / instrument / chemical engineers) - their function is to provide technical assistance to the group, as well as a dynamic approach to problem solving.

Team members should:

- Be experienced and knowledgeable about the job.
- Have credibility with the work group.
- Understand the JSA process.
- Be persistent in finding solutions to bring about a safe workplace.

The size of the group will usually depend on the size of the facility and the nature of the work. The number of people is not as important as having the right people to conduct a thorough analysis. This procedure discusses Resources, Roles and Responsibilities of the team members.

4.3 Breaking the Job Down

Once the group has been formed, the job being analyzed should be broken down and organized into its component parts. Each task necessary for the completion of the job should be identified and included in the JSA. The entire job needs to be considered from preparation through clean-up and turnover back to operation. Where it is possible, the facilitator of the group should perform this task in advance.

When describing these tasks, use action words to describe “what” is being done; avoid statements that tell “how” the work is done. Be sure to include the item to which the action applies (for example, “lift the box,” “remove the extinguisher,” etc.).

Determining the steps of the job is best done by observing the workers performing the job and paying close attention to each step. The understanding of the job and the experience the worker brings is particularly important in this step.

Other areas the team should be sure to consider are plant layout information and equipment specifications. Supervisors and workers in adjacent areas bring much value to this process.

Once the team identifies the steps of the job, they should place the steps in the proper order and determine if any steps will be performed in parallel (i.e. gas testing while hot work is proceeding). It is a good idea to consult the workers performing the job, and the operator on the team in this step to ensure accuracy.

4.4 Identifying the Hazards

Identifying hazards requires close observations and knowledge of the particular job being looked at. This part of the process looks at the steps of the job to search for all potential and existing hazards. “What if” questions should be asked to identify possible hazards and their causes. The focus here is what could go wrong with this step.

For example:

- What if there are still flammable vapors inside the vessel?
- What if employees are exposed to the inert gas?

Both physical conditions (chemicals, tools, work space, etc.) and environmental factors (heat, cold, noise, lighting, etc.) as well as human actions or behaviors (need to stand on a slippery or unstable surface, extended reach to operate a valve, lifting bulky objects) are looked at during this stage of the process.

The group should take time to look back on similar work, or working conditions where an accident or near miss has occurred and consider the similarities between the jobs. It may be helpful in identifying hazards that are not obvious if the group takes into account what controls were in place or should have been in place.

The group should also consider where in the job the accident or near miss occurred, if the same hazard exists in this job, and what controls may be in place to prevent such an event.

4.5 Developing Solutions

In this step of the process it becomes very important to follow the tasks of the job in order they are performed in and work down the list of hazards that were identified. Creating a solution or control for a step out of order can cause new, unidentified hazards in previous steps. When a control is put into place, the process may be altered, thus creating new hazards that may need to be considered. Any change made in the process could possibly change part of, or the entire process. It is also important not to move to the next task in the job until the hazard has been eliminated or controlled.

Generally the methods for controlling a hazard are:

- **<u>Elimination of the Hazard</u>**: This is the most desirable method of hazard control. There are a few ways hazards can be eliminated:

- Choose another process or modifying the existing process: (for example, can cold work be performed instead of hot work?)
- Substitute a less hazardous material: If a harmful substance such as a strong acid or base is used, can a less dangerous substance be used?
- Adding or increasing ventilation: helps to eliminate the hazard of a flammable or explosive atmosphere.
- Isolate the area: separate the work area with a temporary fire wall or similar device, or shutdown nearby operations if that is not possible.
- Substitute tools or equipment: (for example, should pneumatic tools be used instead of electrical tools?)

- **Engineering controls**: These types of controls usually include enclosures or guards to restrict access to the hazardous area. A good example is welding screens or enclosures. A properly engineered control can nearly eliminate a hazard.
- **Administrative controls**: Examples of this type of controls include such things as procedures for conducting work safely, personal protective equipment (PPE), managing the length of exposures or reducing frequency of the job, and/or written requirements to be completed before work is started (i.e. checklists).
- **Raise awareness in the area of the job**: Be sure other workers in the area are aware of the work taking place and understand not only the dangers associated with the work, but also the emergency procedures if something were to go wrong.
- **Provide emergency response facilities**: This includes primarily having materials and supplies (eye wash, safety showers, fire suppression equipment) on-site and available in case of an accident.

* It is important to note that raising awareness and emergency facilities are not controls and do nothing to remove or mitigate the risk involved with the work. In practice, these methods should always be in place regardless of the working conditions.

5. ROLES AND RESPONSIBILITIES

This part of the process identifies the roles, responsibilities and authorities of those in the group to ensure a quality JSA are completed. Here the team needs to define the necessary skills, experience and training group members require. Examples of responsibilities include the person(s) who will make sure that the hazards identified and the controls deemed necessary are given proper attention, it may also outline who is responsible to implement the control.

This section should also include the process owner in the facility who should monitor the job for changes in the procedure or other changes rendering the JSA obsolete.

5.1 Performing Authority

Performing authority is the personnel who has a job task to accomplish i.e. foremen, supervisors, pushers etc. to do the work as follows:

- Initiates need for JSA
- Facilitates the development and completion thereof
- Involves all involved in the job task JSA & documents such
- Makes written JSA available at job task site
- Files Permit to Work (if applicable) and provides accompanying JSA

- Cognizant of any changing conditions and utilizes "Stop Work Authority" (SWA) as mandated by any such changes
- Performs job task

5.2 Accompanying Workers (if applicable)

- Actively participates in defining specific JSA for job task at-hand
- Cognizant of changing conditions and utilizes SWA where deemed necessary

5.3 Non-accompanying Workers (if applicable)

- Provide review and/or oversight into JSA development (Desk-top Review Process may be used as checklist tool)
- Apply a Behavior Based Safety approach to the job task
- Reinforce desired behaviors for the applicable use of the JSA process.

5.4 JSA Process Sponsor

- Ensures the process administration responsibilities are understood and executed
- Gathers data on the process performance
- Coordinates process reviews
- Approves changes, after consultation with JSA Process Advisor / Subject Matter Expert (SME)

5.5 JSA Process Advisor (Subject Matter Experts - SME) (if applicable)

- Maintains the process documentation
- Conducts the evaluation of "measurement and verification" parameters
- Develops and recommends process improvements
- Coordinates / tracks assessment findings
- Informs field personnel of process changes
- Makes recommendations for continuous improvement
- Coach field personnel in properly performing JSAs
- Review JSAs to ensure quality
- Ensure conformance with written JSA while work is being performed.

6. MEASUREMENT AND VERIFICATION

Metrics help determine the effectiveness of the process and confirms that objectives are being met. The JSA process needs to include these metrics.

Examples include:

- The number of JSAs performed
- The number of JSAs to be audited

This would be to make certain that hazards are being identified and set quotas for auditing.

Verification determines the critical steps of the process and how effectively the system is working to reduce risk. The prime example of this section is the actual audit process. A team or process owner should specify how the auditing process will work, what it will look at and how ratings will be assigned. This area is instrumental in assuring safety is long-term, and should help to recognize changing conditions in the job process.

7. CONTINUAL IMPROVEMENT

Evaluation

Based on the findings of the Measurement and Verification process, changes may need to be made in the JSA process. An evaluation should be made on the effectiveness of the current JSA program at least annually.

Improvement

The result of the evaluation needs to be cycled through the business planning process to implement the needed improvements. At this point the owner of the process would design and implement the change.

8. INCORPORATING THE JSA INTO THE JOB

After the JSA is created, the conditions of the JSA need to be implemented before the work begins.
This should be done in a variety of places:

- <u>Pre-Job Planning</u> - the JSA is the principle tool that should be used when planning work. Only after the JSA has been completed and reviewed in this planning session should a work order be formulated or a permit issued.

- <u>Pre-Job Communication</u> - reviewing the JSA with those performing the work is vital. The workers must understand the process, hazards and controls in place in order for them to work safely and effectively.

- <u>Safety Meetings</u> - similar to Pre-Job Communication, the JSA should also be reviewed during a Pre-Job safety meeting and daily “tail-gate talks” so that others in the area including process workers, operators and/or supervisors are all fully aware of the process, hazards and controls. This should be part of raising awareness around the work-site.

- <u>Auditing</u> - the JSA outlines how the work should be done, the hazards of each step and the controls necessary to eliminate or mitigate the hazard. The JSA is an excellent audit tool to ensure that each step is being completed in the manner it is intended in the procedure.

9. USING THE JSA EFFECTIVELY

Similar to the above section regarding incorporating the JSA into the job, using the JSA effectively requires the JSA to be included in everyday work operations. The JSA should be used for training both new and existing employees.

Training New Employees

The JSA is an effective tool for training new employees. It should be used in the following ways:

- Use the JSA to teach new employees how to do a job safely.
- The JSA helps workers to recognize hazards and understand controls that are in place or will be in place.
- The JSA is a good outline for workplace safety observations and/or coaching.

Training Existing Employees

All employees should have the same training on all workplace operations. After the above training has been implemented, these other areas should also be covered:

- Review the JSA during pre-job briefings to help employees work safely on jobs that are done on an irregular / infrequent basis.
- When a near miss or accident occurs due to failure to follow a procedure covered in an existing JSA, review the facts with everyone involved to prevent recurrence.
- In pre-job briefings and safety meetings be sure to cover these points:
    - Details of activities involved in completing the work (including individual actions and responsibilities at various stages of the job).
    - All potential hazards identified.
    - Control measures in place or to be in place.

Pre-Job Briefings and Safety Meetings

Utilizing the JSA at pre-job briefings and safety meetings does the following things:

- Creates a common understanding about what it takes to do the job safely.
- Identifies the need for further training.
- Provides those involved with the job the opportunity to identify further hazards and control measures, as well as gain understanding about existing hazards and controls.

It is very important at this stage that is made clear that if conditions or personnel should change or any assumptions in planning be proven false, work should stop until conditions are re-assessed and judged safe.

Appendix A
JSA Form

Job / Task Title :		**Date :**	
Dept :		**Performing Authority :**	
Section / Location :		**Process Sponsor :**	
PPE to be used :			

Instructions:
1. Write the name of the job or task in the space provided. **2**. Write the steps of the task in a safe sequence. **3**. List all possible hazards involved in each step as well as reaction to failure. **4**. In the Safe Plan / Control column, provide the corrective actions that will be taken to prevent the hazards and injury from reaction to failure. **5**. In the Resources column, list the resources that are needed to achieve the "Safe Plan" to overcome the hazards and stop reaction to failure such as reaching in when something moves, etc. **6**. In resources column list tools needed to do the job, additional safety equipment, etc. **7.** Have each team member that helped develop and will use this JSA sign in the spaces provided at the bottom. **8**. Review the JSA at the end of the task for improvements.

(NOTE THE WORK SHALL STOP IF CONDITIONS CHANGE, JOB CHANGES, OR DEFICIENCY IN PLAN IS NOTED.)

Steps of Task		**Hazard / Reaction to Failure**		**Safe Plan / Control**		**Resources**

Diagram of worksite (draw in equipment, wind direction, and identify hazards e.g. power lines, tripping hazards, energy sources, hot surfaces, roadways, etc.)

JSA Checklist Review

Review the following after the Job Safety Analysis has been completed to ensure all hazards have been noted.

Required Permits		**Head, Eye & Face Protection**		**Hand & Arms Protection**		**Foot Protection**	
	Hot Work		Hard Hat		Work Gloves		Sturdy Work Boots
	Utility Clearance		Safety Glasses		Cut Resistant Gloves		Safety Steel Toed Boots
	Confined Space		Face Shield		Nytrel Gloves		Rubber Boots
	Critical Lift		Goggles / Chemical		Surgical Gloves		Rubber Boot Covers
	Lock Out/Tag Out		Welding Hood		Rubber Gloves	**Body Protection**	
	Soil Disturbance				Long Arm Sleeves		Cotton Coveralls
	General Work	**Respiratory Protection**			Welding Gloves		Tyvek / Poly Coated Tyvek
	Vehicle Entry		Dusk Mask	**Monitors**			Safety Vest
			Air Purifying		Quad or Tri-cell		Full Body Harness & Lanyard
			Supplied Air /SCBA		Individual		Saranex

EMERGENCY CONTACTS AND ACTION PLAN

Supervisor : ______________________________

Safety Rep : ______________________________

Other : ______________________________

Assembly Area : ______________________________

TEAM MEMBER SIGNATURES

______________________ ______________________

______________________ ______________________

______________________ ______________________

PERFORMING SUPERVISOR SIGNATURE
certifies the completion of the Hazard Assessment site review.

Supervisor's Signature : ______________________

Date : ______________________

Appendix B

What to Look for During a JSA

Environmental Conditions - are there conditions that may be hazardous to safety or health?

- Are there any gases, vapors, mists, fumes, or dust in the area?
- Is the ventilation adequate to remove any air contaminants?
- Are there any sources of heat or cold?
- Are there any radiation sources?
- Is there adequate lighting to see the complete job?

Injurious Contact - is there a danger of striking against, being struck by, caught between, caught on, caught in, or otherwise making harmful contact with an object?

- Can people come in contact with, be struck by, or snagged by moving parts of equipment?
- Are there any in-running nip points between two moving parts (e.g. belt & pulley)?
- Is there sufficient room to work? To stay out of the line-of-fire? Out of traffic?
- Is there any material (water, mud, oil, rocks, etc.) or part which could strike people?
- Are energy sources controlled (by way of a Lock-out / Tag-out program)?
- Are machine controls safeguarded?

Overexertion - can a strain be caused by pushing, pulling, lifting, bending, twisting, or by repetitive motions?

- Does the employee have good body position or placement?
- Does job require lifting an excessive amount of weight?
- Does employee twist while lifting?
- Does this job have repetitive motions?

Slips, Trips, & Falls - is there a potential for this type of occurrence?

- Are there spills of water, oil, or other slick material on the floor?
- Are there any lowered or elevated surfaces?
- Are there any tripping hazards on the floor?
- Is the area picked-up?
- Is there any chance of a fall to another level?

Other Key Safety Behaviors

- Do employees wear the proper PPE for the job?
- Do employees use the correct tools for the job?
- Do employees lift heavy or awkward objects with equipment rated for load?
- Is communication good on jobs involving several people or work crews?

Does someone assure that equipment receives regular maintenance?

1 FOR MEDIUM - HIGH RISK JOB

1.1 General requirement:

1.1.1 General Physical Examination

a. Head
b. Visual acuity and Eyes
c. Ears, nose, throat
d. Mouth and Teeth
e. Neck
f. Lung
g. Heart
h. Stomach
i. Liver
j. Spleen
k. Hands
l. Legs
m. Skin
n. Genital
o. Movement and strength of upper and lower limbs
Chest X – Ray

1.1.2 Urine Routine

1.1.3 Hematology Routine: HB, WBC, DIFF, ESR

1.1.4 Blood chemistry:
Cholesterol, HDL Cholesterol, LDL Cholesterol, Triglyceride, Glucose Fasting, SGOT, SGPT, Bilirubin, HBsAg, Anti HAV Total, Creatinine, Ureum, Uric Acid.

1.2 Frequency

1.1.1 Person below 40 years old shall have bi-annually medical check up

1.1.2 Person above 40 years old shall have annual medical check up

1.1.3 Special 6 month check up conducted for employees exposed to work place hazard. Items to be checked depend on the hazard.

1.3 Other:

1.3.1 Stool culture-routine and Anti HAV Total should be checked for food handler every 6 months.

1.3.2 Audiometry should be checked for these who expose to high level of noise.

1.3.3 Visiotest should be checked for crane operator or those positions which require critical vision include visual field test.

1.3.4 Spirometry should be checked for those who are exposed to chemical hazard.

2 MCU STANDARD FOR LOW RISK JOB

Medical examinations for low risk job minimum requirement shall include:

2.1 Doctor's Consultation

2.1.1 Medical history
2.1.2 Physical examination
2.1.3 Vital signs: height, weight, blood pressure, pulse/rhythm
2.1.4 Medical fitness certificate

2.2 ECG

2.3 Chest X-Ray by digital X-Ray

2.4 Visus + Visual field

2.5 Audiometry

2.6 Color blind

2.7 Laboratory:

2.7.1 Urinalysis
2.7.2 Hematology (CBC, Hb, Erythocyte, Leucocyte, ESR, Differential Count, Hematocrit, Thrombocyte, Blood Group)
2.7.3 Blood Chemistry
2.7.4 Liver function(SGOT, SGPT)
2.7.5 Glucose (Fasting Glucose)
2.7.6 Kidney Function Test (BUN, Creatinin, Uric Acid)
2.7.7 Lipid Profile (Cholesterol Total, Triglyceride)

3 MCU STANDARD FOR OFFICE BOYS/GIRLS & FOOD HANDLER

Medical examinations for job type such as office boys/girls which they will have potential to direct contact with food & beverage, they shall check with the following requirement:

3.1 Doctor's Consultation

3.1.1 Medical history
3.1.2 Physical examination
3.1.3 Vital signs: height, weight, blood pressure, pulse/rhythm
3.1.4 Medical fitness certificate

3.2 Chest X-Ray by digital X-Ray (once a year)

3.3 Laboratory:

3.3.1 Urinalysis
3.3.2 Hematology (CBC, Hb, Erythrocyte, Leucocyte, ESR, Differential Count, Hematocrit, Thrombocyte, Blood Group)
3.3.3 Blood Chemistry
3.3.4 Liver function(SGOT, SGPT)
3.3.5 Glucose (Fasting Glucose)
3.3.6 Kidney Function Test (BUN, Creatinin, Uric Acid)
3.3.7 Lipid Profile (Cholesterol Total, Triglyceride)

3.4 Other

3.4.1 Stool culture-routine **(once a year)**
3.4.2 Anti HAV Total

3.5 Frequency:

3.5.1 Person below 40 years old shall have bi-annually medical check up
3.5.2 Person above 40 years old shall have annual medical check up

4 MCU STANDARD FOR DRIVER & OPERATOR

Medical examinations for driver and operator shall include but not limited to :

4.1 Doctor's consultation

4.1.1 Medical history
4.1.2 Physical examination
4.1.3 Vital signs: height, weight, blood pressure, pulse/rhythm
4.1.4 Medical fitness certificate

4.2 ECG
4.3 Chest X-Ray by digital X-Ray
4.4 Visus + Visual field
4.5 Audiometry
4.6 Color blind
4.7 Laboratory:

4.7.1 Urinalysis
4.7.2 Hematology (CBC, Hb, Erythocyte, Leucocyte,ESR, Differential count, Hematocrit, Thrombocyte, Blood Group)
4.7.3 Blood Chemistry
4.7.4 Liver function(SGOT, SGPT)
4.7.5 Glucose (Fasting Glucose)
4.7.6 Kidney Function Test (BUN, Creatinin, Uric Acid)
4.7.7 Lipid Profile (Cholesterol Total, Trygliceride)

TABLE. MEDICAL CHECK UP REQUIREMENT

Medical Check Required / Job Risk	Doctor Consultation				Specific						Laboratory							Other	
	Medical History	Physical Examination	Vital Sign	Certificate	ECG	Chest X-Ray	Visus	Audiometri	Color Blind	Spiromentry	Urine Analysis	Blood Chemistry	Liver function	Glucose (fasting)	Hematology	Kidney Function	Lipid Profile	Stool Culture	Anti HAV Total
HIGH RISK TO MEDIUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	--	--
LOW RISK	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	--	--
FOOD HANDLER/ OFFICE BOY (GIRLS)	X	X	X	X	--	X	--	--	--	--	X	X	X	X	X	X	X	X	X
DRIVER & OPERATOR	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	--	--

Note :

Hematology	CBC, Hb, Erythocyte, Leucocyte,ESR, Differential count, Hematocrit, Thrombocyte, Blood Group
Liver function	SGOT (*Serum Glutamik Oksaloasetik Transaminase*), SGPT (*Serum Glutamik Pyruvik Transaminase*), HBsAg
Kidney Function Test	BUN (Blood Urea Nitrogen), Creatinin, Uric Acid
Lipid Profile	Cholesterol Total (HDL, LDL, Trygliceride)
Stool culture-routine & Anti HAV Total	should be checked for food handler every 6 months.
Audiometry	should be checked for these who expose to high level of noise.
Visiotest	should be checked for crane operator or those positions which require critical vision include visual field test.
Spirometry	should be checked for those who are exposed to chemical hazard.

supremeenergy	SAFETY HEALTH AND ENVIRONMENT WORKPLACE HEALTH & HYGIENE	PROCEDURE
CORPORATE	FIRST AID AND MEDICAL CARE	SE-MSHE-WHH-PRO-0001 Revision: 1

APPROVAL

	POSITION	NAME	SIGNATURE	DATE
Prepared by	SHE Engineer	Erwin Patrisa Floris		
Reviewed By	Sr. SHE Manager	M. Arief Tarunaprawira		
Approved By	VP. Relation & SHE	Priyandaru Effendi		17/05/2013

REVISION HISTORY

REV	DATE	BY	REVIEWED	APPROVED	DESCRIPTION
0					For Use
1	19/09/19	AWA	MAT	PE	Add of MCU minimum requirement

TABLE OF CONTENTS

1. INTRODUCTION

The procedure describe first aid and medical care that covers a variety of SUPREME ENERGY working locations and conditions, includes first aid and medical facilities and associated equipment. It examines the medical surveillance provided for all staff and particularly those involved in the Medical Surveillance Program by virtue of the potentially hazardous nature of the tasks they perform.

This procedure shall be revised as necessary to fit local conditions and regulatory requirements and, as a result, introduce a higher standard of care than suggested here.

2. STAFF AND FACILITIES IN FIELD OPERATIONS

2.1 General

Medical staffs - the numbers of medical personnel and their qualifications - should be based on the following factors:

- The total number of personnel employed in the particular location
- The availability of medical service to contractors' and employees' dependents
- The hazardous nature of the operation
- The location of the operation in relation to distance from medical clinics and hospitals
- The qualifications of staff in local medical clinics and hospitals

2.2 For Exploration / Isolated Drilling Operations

At least one each of the following qualified personnel - equipped with a suitable field kit - should accompany each producing, construction, drilling, surveying, seismic recording or base camp operation.

- For operations near population centers (where the patient can be transported to a qualified doctor and medical facility in less than four hours), both:
  - A person with certified, advanced, first aid training
  - A person with an occupational first aid certificate

- For operations in remote areas (where the patient cannot be transported to a qualified doctor and medical facility within four hours), both:
  - A qualified physician's assistant or equivalent (e.g. a nurse practitioner) experienced in handling industrial injuries
  - A person with certified advanced first aid training

- For jungle / desert (or equivalent) operations with fly camps:
  - Base Camp
    - At least one qualified physician's assistant or the equivalent at all times.
    - Over 300 People: A suitably qualified doctor at all times
    - Under 300 People: A suitably qualified doctor on a monthly visit schedule

- Fly Camp of 20 People or More

Ideally, a suitably qualified nurse or physician's assistant; or, if that is impractical due to local conditions, a person with certified first aid training.

2.3 For Large Producing Operations

Most established producing operations have medical support facilities consisting of Company medical staff or contract medical care in an on-site clinic.

The staff's size and facilities' complexity varies. SUPREME ENERGY's Medical Staff has not established staffing and facility criteria for large operations but will provide assistance with establishing and periodically confirming the adequacy of staffing of facilities.

All vehicles, aircraft, and watercraft should be equipped with suitable first aid kits; workshops and offices with larger kits.

3. PARAMEDIC STATION

- Paramedic stations are located at specific points at the site. The location of the facilities will be identified on a site plan.
- There should, where possible, be a wash hand basin in the vicinity.
- In buildings where a sick room is provided, a first aid box should be available at that location.
- The paramedic station area should always be maintained in a tidy and clean condition. Always clean up after using any items from the station.
- Employees should ensure they obtain first aid treatment for all injuries, no matter how small.
- Each major work location should maintain at least one first aid box.

The number of first aid boxes for a site is related to the number of persons working at the site, and the number of separate buildings and work areas. Each distinct work area shall have a first aid box e.g. workshops, control room, office area. First aid boxes will be located at key points throughout the work area (water pumping station, well heads) or at key road junctions.

Each company vehicle will have a fully equipped first aid box.
Work teams will also carry a first aid box with them, e.g. grass cutting gang, etc.

4. FIRST AID BOXES

- First aid equipment should be stored in a suitable cabinet of wood or metal with a tightly closing lid or door.
- The box should be clearly marked ‘First Aid’ and will be green in color. The location of first aid boxes will be shown on a site layout plan.

- If the box is locked there must be several keys and the names and locations of key holders shown on the outside of the box.
- Nothing other than standard first aid equipment should be kept in the box.

Table 4.1: *Minimum Scale of First Aid Requisitions* gives a guideline of the basic requirements that should be provided in first aid boxes, dependent on the number of personnel at the site.

- The first aid box should be customized to suit its location and the type of injuries that may be expected.
- Every first aid box will have a list indicating the contents of the box and the first aid person responsible for that box. This person should be contacted to obtain any supplies. (alternatively a first aid box will have a register and this is to be completed when items are taken from the box.)
- It is the responsibility of the first aid person to periodically check (once a month) their first aid station and re-planes supplies.
- The first aid box shall contain a first aid manual.

Some non-prescription medications like analgesics, pain relievers, antacids, cold and hay-fever remedies will also be available at the paramedic station. These are designed to keep people on the job and allow them to work more safely and efficiently than if they were in discomfort. Most of these medications are unit-dosed with directions and cautions in self-dispensing boxes to reduce or eliminate any liabilities associated with dispensing from a bottle. The paramedic will advise on dose rates, etc.

The development that have influenced the contents of first aid kits in recent years are increased concerns about infectious and contagious diseases such as HIV, hepatitis and tuberculosis, and a heightened awareness of lost-time injuries. As diseases become more prevalent, many people, even those trained in CPR (Cardio Pulmonary Resuscitation), are reluctant to give first aid to strangers. For that reason, first aid kits now contain latex gloves, antimicrobial solutions, wipes and sprays to protect against pathogens, and one-way valve airway masks.

Table 4.1: Minimum Scale of First Aid Requisitions

	Number of Employees						
	Up to 5	6 - 25	26 - 50	51 - 75	76 - 100	101 - 250	Over 250
30g cotton wool	2	3	4	5	6	7	8
225g cotton wool		1	1	1	1	1	1
25mm bandages, open wove	2	3	4	5	6	8	12
50mm bandages, open wove	1	2	3	4	6	8	12
Triangular bandages	2	2	2	4	4	6	6
Sterile dressings - large	2	2	6	9	12	18	24
Sterile dressings - small	2	3	12	18	24	36	36
Adhesive wound dressings (assorted)	6	6	18	30	48	72	96
Solution of 3% cetrimide and 0.3% chlorhexidine	100ml	200ml	400ml	400ml	400ml	2 x 400ml	2 x 400ml
Scissors	small	small	small	small	125mm	125mm	125mm
Safety pins	1 card	1 card	1 card	1 card	1 card	2 cards	2 cards
Fine-pointed tweezers or splinter forceps	1	1	1	1	1	1	1
Forceps, non-toothed			1	1	1	2	4
Antiseptic cream (tube)			1 small	1 small	1 small	1 large	1 large
Clinical thermometer						1	1
First aid manual (Red Cross or St. John)	1	1	1	1	1	1	1
Accident register forms and pencil	1 pad	1 pad	1 pad	1 pad	1 pad	1 pad	1 pad
Kidney bowl 125mm					1	2	2
Splints (leg)						1	1
Sterilizer							1
Dressing drum (if Paramedic employed)							1
Receptacle for soiled dressings				1	1	1	1
Where wet work is carried on in a Workplace:	1	1	1	1	1	1	2

	Number of Employees						
	Up to 5	6 - 25	26 - 50	51 - 75	76 - 100	101 - 250	Over 250
Waterproof adhesive plaster (reels)							
Disposal gloves (large multi fitting)	2prs	4prs	4prs	8prs	8prs	12prs	12prs
Antimicrobial Wipes	1	2	3	4	6	8	12
One way valve air-way mask	1	2	2	3	3	4	4

5. FIRST AIDERS

Management must ensure that a sufficient number of personnel throughout the organization are trained in first aid. Employees should be encouraged to volunteer for training in first aid techniques.

- First aid courses will be arranged and time will be given to attend courses.
- First aiders will hold an appropriate first aid certificate.
- First aid certificates will be issued by a recognized training body, e.g. Red Cross, etc.
- Trained first aiders will be easily identifiable at the site with the words 'First Aider' fixed to cloth above the breast pocket.
- Each area or group of workers has an assigned first aider and to be contacted when any accidents or near-misses occur.
- It is the responsibility of the SHE Representative to ensure that a register of first aiders is maintained and that training and refresher courses are undertaken to ensure that qualifications are kept current.

Duties of first aiders include:

- maintenance of the first aid boxes and stations
- attendance at any accidents or near-misses in their area or as required
- checking the accident register is completed when an accident or near-miss occurs and provide action according to the prescribed procedure
- vigilance for any unsafe conditions or hazards in their area and reporting these to supervisors.

6. EMERGENCY PREPAREDNESS

When an emergency occurs:

- Report the nature and location of the emergency to the appropriate control (fire, police, health and safety, or medical (paramedics)). Give name, phone number, location and estimation of hazard (number of people, if unconscious, trapped, burned, chemical, electrical, etc.).
- Contact group's first aider.
- Notify others in the area and supervisor.
- Wait for response personnel or send someone else.
- Leave communication lines open, do not make other phone calls unless emergency related.

Do what is necessary to protect life while waiting for assistance. KEEP CALM. First aid personnel and/or paramedics should be available immediately. If not, the following general comments are made.

- **Safeguard injured personnel**. Do not remove unless in further danger. Keep them warm. Unnecessary movement can severely complicate neck injuries or fractures.
- **Remove contamination**, if possible. If chemicals are spilled on someone get them to the shower or eyewash immediately. Remove any clothing contaminated with chemicals with care to avoid further contamination of skin or eyes. Find out what chemicals are involved.
- **CPR (Cardio Pulmonary Resuscitation),** If an injured person is not breathing, provide mouth to mouth resuscitation. The following procedure is recommended: Place the person face up, clear the mouth of any obstruction, and loosen tight clothing. Lift the neck and tilt the head back, so the chin is pointed upward. Insert your thumb in the mouth, grasp the lower jaw and lift it forcibly upward and forward. Pinch the nose and blow vigorously through the mouth to make the chest expand. Repeat every four to five seconds. If the victim's chest does not expand recheck the mouth for any obstruction, tilt the head back and resume blowing into the mouth. **CPR is not to be undertaken unless training has been given**.
- **Control bleeding** by elevating the injury above the heart, if possible. If blood is spurting place a sterile pad on the wound and apply firm pressure. Wrap the injured person to avoid shock. Tourniquets should be applied only by persons trained in first aid.
- Do not touch a person in contact with a live electrical circuit. **Disconnect the power** first or the rescuer may become seriously injured.

Refer to First Aid Manual with first aid box for more specific first aid treatment measures.

7. EMERGENCY SHOWERS AND EYE WASHES

Eyewash and shower stations should be available to all employees whose faces or bodies may come into contact with hazardous material.

- Emergency flushing / irrigating equipment should be located within 30 meters (or 10 seconds travel time) of the hazard.
- Emergency irrigating equipment should be identified by a highly visible sign.
- Emergency / irrigating equipment should be connected to a source of potable water.
- A minimum area of 0.9 meters in diameter should remain free of obstruction immediately below the flushing / irrigating equipment.
- The flushing / irrigating equipment valves should be designed to allow constant water flow without the use of the operator's hand. The valve should remain open until it is intentionally closed.
- Safety showers and eyewashes should be activated weekly to flush lines and to verify proper operation.

- Emergency showers should deliver a minimum of 75 liters (20 gallons) per minute for 15 minutes.
- Emergency eyewash stations should deliver a minimum of 1.5 liters (0.4 gallons) per minute for 15 minutes.
- Emergency drench hoses should deliver a minimum of 11.4 liters (3 gallons) per minute for 15 minutes.
- All employees who may be potentially exposed to splashes of hazardous substances shall be trained in the proper use of flushing/irrigating equipment.

8. MEDICAL SURVEILLANCE

8.1 Medical Surveillance

(See Figure 8.1: *Medical Surveillance Process*)

- Employees engaged in potentially dangerous occupations and those working with certain hazardous substances will be enrolled in the Medical Surveillance Program.
- The program will be operated under the surveillance of a registered medical practitioner trained in the requisite testing or medical examinations for the substances in question.
- The requirements for the program will be derived from numerous sources including OSHA, NIOSH and other approved guidelines and standards.
- The employer is responsible for the costs of the Medical Surveillance Program.
- Medical surveillance information will not be used for employment purposes such as hiring and firing.

Where the employee is undergoing medical surveillance the medical practitioner shall ensure, as soon as practicable, that:

- the employee is notified of results, together with an explanation of the results
- the employee is notified of the outcome and of the need for remedial action
- medical records obtained during the medical surveillance are confidential
- medical records are made available to the employee or to his representative, with written permission from that person
- the informed written consent of the employee shall be obtained before the medical records which identify that person are provided to a third party not covered by professional confidentiality.

8.2 Inoculations

As part of pre-employment assessment it will be determined whether a person has the required inoculations to work safely at the site. This could include whooping cough, tuberculosis, measles, diphtheria, polio, tetanus, hepatitis B.

8.3 Hearing Conservation

Prolonged exposure to excessively loud noise can cause noise-induced deafness. The purpose of having a hearing conservation program is to prevent deafness by controlling the noise hazard involving all personnel in the company.

The Hearing Conservation Program (HCP) targets those most at risk, that is, those workers who are exposed to an average noise level of 85dBA or more for eight hours per day or 40 hours per week. In addition, if the average noise level is 85dBA or more, engineering noise control measures should be implemented.

Where employees are to be placed in a job requiring participation in the HCP the following will be undertaken:

- baseline audiogram and medical history to determine pre-existing medical pathology of the ear
- work history taken to determine past noise exposures and also non-work exposures
- annual examination to include annual history of work exposures, use of personal protective equipment and other work-related or non-work-related exposures to noise
- provision of hearing protectors and instructions in their care and use
- health education on the importance and necessity of using hearing protectors
- a final audiometric examination of all employees in the HCP before termination of employment.

Audiograms must follow 14 hours of no known exposure to sound levels in excess of 85dBA. This interval should be sufficient to allow recovery from noise induced temporary threshold shift.

Personnel suffering acute diseases of the ear should not be placed in hazardous noise areas until the condition has abated.

In association with the annual medical examination and audiometric testing it may be determined that further clinical audiological evaluation or ontological examination is necessary. This may be the case if it is suspected that medical pathology of the ear is caused or aggravated by the wearing of hearing protectors or if further general concerns are held by paramedics. The cost of this will be covered by the company.

9. PRE-EMPLOYMENT CHECKS

A comprehensive and confidential medical examination is required of all new employees and temporary employees hired for three months or more. Medical examinations may be offered periodically during employment and at the time of termination or retirement.

Woman who are, or plan to become pregnant should consult the medical service facility about their work environment.

10.PARAMEDICS

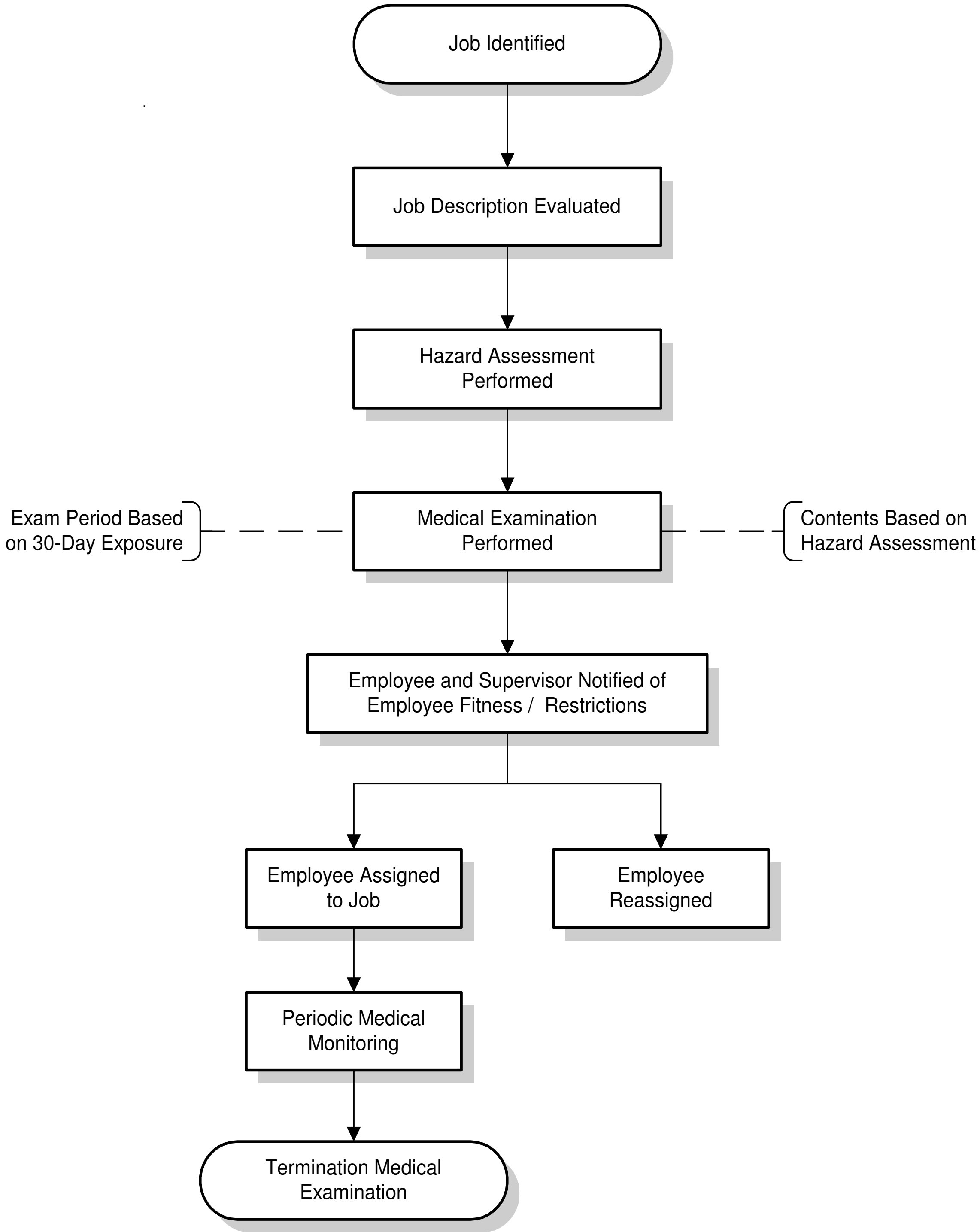
A medical service facility is maintained at SUPREME ENERGY facilities and is staffed with paramedics. They are available to treat injuries and minor illnesses and to advise employees of medical conditions that should be discussed with or treated by an outside personal physician. Supervisors shall require their employees to report as soon as possible all illnesses and injuries that occur at work so that medical evaluation and treatment may be provided promptly and effectively. On returning to work after a work-related illness or injury resulting in lost time, employees should report to the medical service facility for an evaluation of their condition and ability to resume normal duties. For non-occupational health problems requiring an absence of three or more consecutive work days the medical service facility should be contacted and an explanation from a personal physician may be required.

11.TRAINING

A scaled system of training in first aid will be provided.

- As part of the new employee or contractor induction course, personnel will be made aware of the location of first aid boxes, how to identify and summon first aiders and paramedics, and the emergency procedures to follow.
- Basic first aid training course for staff. How to deal with cuts, abrasions, burns, etc. until a trained first aider arrives.
- CPR training to first aiders and supervisory staff.
- First aid certificate training for first aiders.
- Health awareness courses by paramedic.

Figure 8.1 Medical Surveillance Process



12.APPENDIX

- SE-MSHE-WHH-PRO-0001-01 Recommended Medical Check Up Standard

supremeenergy	**SAFETY HEALTH AND ENVIRONMENT WORK RULES**	**PROCEDURE**
CORPORATE	**MOTORCYCLE RIDING**	SE-MSHE-WOR-PRO-0013 Revision: 0

APPROVAL

	POSITION	NAME	SIGNATURE	DATE
Prepared by	SHE Engineer	Erwin Patrisa Floris		
Reviewed By	Sr. SHE Manager	M. Arief Tarunaprawira		
Approved By	VP Relation & SHE	Priyandaru Effendi		**10/10/2014**

REVISION HISTORY

REV	DATE	BY	REVIEWED	APPROVED	DESCRIPTION
0					For Use

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1 INTRODUCTION

It is widely known that motorcycle riding is one of the most dangerous activity and has contributed to accidents within the Company work areas.

A proper vehicle shall be used to transport employees. Employees shall not be transported on the back of a pick-up vehicle (refer to SHE Procedure for Motor Vehicle Safety & Heavy Equipment).

All Supreme Energy and its contractors employees are not allowed to use motorcycle within Company working area where the road is accessible by light vehicle. Exception to this procedure only can be given through approval from Kepala Teknik Panas Bumi (KTPB).

It is Company policy to provide a safe working environment and expect safe motorcycle driving practices from its drivers or passengers. This procedure outlines a general guidance for motorcycle safety.

Motorcycling is a skill for life and any skill needs to be practiced and developed by getting further on-road experience to deal with any situation and training if possible.

Management and Supervisors are responsible for maintaining a safe motorcycle driving environment and must lead by example.

Supervisors must ensure drivers and passengers are aware of and follow safe motorcycle driving practices in their respective work area.

All personnel entitle to drive motorcycle or become “a passenger of a rental motorcycle / ojek” share the responsibility for motorcycle driving safety. The effectiveness of Motorcycle Safe Driving Program depends on all personnel accepting safe driving as part of their job.

2 SAFE WORK PRACTICES

The most common motorcycle incidents are:

- Failure to negotiate bend road
- Collision at junction
- Collision while overtaking
- Loss of control on slippery and muddy road
- Loss of control on a steep uphill / downhill road
- Loss of concentration on hazardous road condition

Speed limit is very important in Safe Motorcycle Driving Program and it is designed to increase safety for all road users. It is essential that drivers shall never go faster than the speed limit, both for their own safety and that of other road users.
Maximum speed limits are (except where stated otherwise):

- All Site Roads : 30 km/hrs
- Passing Pedestrians / Groups of People : 20 km/hrs
- Access Road : 40 km/hrs

A motorcycle rider shall always observe speed limits and drive below the speed limit when necessary. This means slowing down :

- when the weather is bad, for example in rain or fog
- during the hours of darkness
- where there are a lot of pedestrians
- on narrow or winding roads
- when there are other hazards such as road works.

Do not overtake when approaching:

- Bends
- Junction
- Pedestrian crossing
- Hills or dips in the road

To improve the safety of all road users and to consider the requirements of the local communities providing ojek service to employees, below are the points that shall be followed:

- Anyone who use motorcycle to perform their work and to reach their workplace e.g. Security Patrols on-duty or others, shall get approval from Kepala Teknik Panas Bumi to be able to do so.
- Only dedicated and assigned motorcycle ojek is allowed to be riden. Company will appoint certain motorcycle ojek to be used within the work area. Employee shall not use un-registered ojek.
- All motorcycle shall pass regular and pre-use inspection.
- Passenger of a motorcycle shall not be more than 1 person.
- Both motorcycle driver and passenger shall wear personal protective equipment e.g. standard helmet for motorcycle, knee and elbow protector.
- Motorcycle are not permitted to overtake other vehicles on the left hand shoulder of any road.
- Drivers should be aware of the nuisance created by dust when passing pedestrians during the dry season and adjust their speed accordingly.

3 MOTORCYCLE SAFETY INSPECTION

As motorcycles are used, parts of them become worn. Tires and brake pads get thinner, joints in the steering mechanism wear and become loose. All these things affect motorcycle performance and safety. A motorcycle which has worn brake pads takes much longer to stop. A motorcycle with worn tires takes longer to stop and is much more likely to skid when stopping or cornering.

For all these reasons, it is essential that all motorcycles are checked regularly and before use (pre-use) to make sure they are fit to be on the road.

3.1 Daily Inspections

- For Company motorcycles : all drivers should inspect their motorcycles daily. Any major or safety-related defects must be reported and corrected before the motorcycle is used. Minor items not affecting safe operation of the motorcycle can be corrected during regularly scheduled preventive maintenance.
- For Company, Contractor and rental motorcycles (ojek) : a formal pre-use inspection should be performed and documented by the driver (for Company and Contractor motorcycle) or by the Site SHE Representative (for ojek).

  The following items should be inspected:
  - Brakes should be well-functioning
  - Headlight should function properly
  - All stop light, turn lights and rear light shall function properly
  - Tires should be inflated to recommended pressures, have adequate tread, and should be free of cuts, breaks or other defects
  - Steering rod should be free from excessive play. Front wheel should be properly aligned
  - Horn should be functional
  - All instruments should work properly
  - Where practical to do so, the motorcycle should also be equipped with a spare spark-plug and essential tools for road repairs

3.2 Preventive Maintenance

In addition to a driver's daily inspection of a motorcycle, a periodic preventive maintenance is essential. A preventive maintenance program based on either mileage or operating hours of the equipment (as recommended by the manufacturer or Company procedure) should be implemented to determine when to perform routine motorcycle maintenance.

A motorcycle safety inspection checklist is given at the appendix of this section (Appendix-1 : Form A1.1 Motorcycle Safety Checklist).

While it takes a trained mechanic to carry out a proper motorcycle inspection, any driver can do a few simple checks to make sure their motorcycle is fit to use. If the steering feels "wobbly", if the brakes take a long time to work, or there are other obvious problems, this should be reported immediately and the motorcycle should not be used until it has been checked.

Before taking a motorcycle out, the driver should carry out a few simple checks by walking around and check the motorcycle :

- tires do not look worn or flat
- lights (including indicators) are working properly
- equipment such as horn are working properly
- never drive a motorcycle which appears to be unsafe

- report any faults to the motorcycle maintenance supervisor.

Appendix A: Form A1.1 Motorcycle Safety Checklist

SUPREME ENERGY
Motorcycle Safety Inspection Checklist

Date:	**Inspector:**	**Employee #:**
Motorcycle No :	**Type:**	**Odometer:**

NO	INSPECTION	OK	UNSAFE	REMARKS
Steering and Suspension				
1.	Free play & steering wheel: .... inches			
2.	Tires (Tread wear, Condition, Inflation)			
3.	Alignment			
Brakes and Hydraulic System				
1.	Pedal Travel			
2.	Fluid Level			
3.	Hand Brake			
Clutch and Transmission Linkage				
1.	Clutch Pedal Free Play			
2.	Clutch Linkage (free and smooth)			
Electrical and Instruments				
1.	Headlights (High/Low Adjustment)			
2.	Tail Lights			
3.	Brake Lights			
4.	Turn Signals			
5.	Instrument Panel Lights			
6.	Horn			
7.	Speedometer			
8.	Fuel Gauge			
9.	Other instrument			
10.	General Wiring Condition			
Engine Compartment				
1.	Tubing / Hoses (General Condition)			
2.	Battery (Secure, Condition)			
3.	Fuel Lines (Routine, Condition)			
Undercarriage				
1.	Fuel Tank (Security and Condition)			
Leaks				
1.	Lines / Hoses			
2.	Engine Oil			
3.	Transmission Oil			

4.	Fuel			
NO	**GENERAL VEHICLE CONDITION**	**OK**	**UNSAFE**	**REMARKS**
Emergency Equipment				
1.	Tools			
2.	Spark Plugs			
Body				
1.	Body Damage			
2.	Rust			
3.	Paint			
4.	Housekeeping			
Engine				
1.	Starting (cold)			
2.	Starting (hot)			
3.	Idling			
4.	Driving			
Transmission				
1.	Shifting			
2.	Noises			
Steering and Suspension				
1.	Tracks True			
2.	Shimy / Wobble			
3.	Steering Effort			
Brakes				
1.	Stop Straight and True			
2.	Squeal			

Checked by Inspector (sign) :	
Comments :	